To develop the Electricity Unit as an undertaking that maximises the value of its electricity supplies and makes effective use of all its resources.

EThekwini Electricity supplies more than 734,000 customers in an area covering nearly 2,000 square kilometres. This encompasses the area of the eThekwini Metropolitan Region and some adjacent areas.

Electricity for the main supply to the Metro Region is purchased at 275,000 Volts from Eskom. EThekwini Electricity also purchases electricity from Eskom for Kingsburgh, Mpumalanga and Magabeni. From these points electricity is transmitted and distributed for use by the full spectrum of customers ranging from the large industrial and commercial sector to the residential communities. EThekwini Electricity purchases just over 5% of the total energy generated by Eskom. EThekwini Electricity operates under the Electricity Regulation Act, 2006. Its policies are determined by the Metropolitan Council of Durban and the National Energy Regulator of South Africa (NERSA).
Our financial position was strong as we closed off the books for the year. We managed to push through 1.32% more kWh's through the network when compared to last year. This increase is welcomed as it breaks the gloomy trend of negative year on year growth as experienced for the last 7 years. Our total revenue for the year amounted to R 12.5 billion. R 7.74 billion accounted for our bulk energy costs while repairs and maintenance and employee related costs accounted for R 523 million and R 901 million respectively. These three cost items account for the majority of the total expenditure incurred for the year. Expansion and refurbishment capital programs progressed well, reaching a total investment of R 600 million.

Outages are inevitable when operating a distribution grid, however theft of electricity and infrastructure are exacerbating the problem. A record of insurance claims against infrastructure theft has amounted to R 54 million for the year. Consequential losses far surpass this amount as the estimated cost of unserved energy is between R 75-R 100 / kWh. Although numerous efforts are underway to curb this scourge, the size and vastness of the network makes this a difficult task.

There has been a welcomed amendment to the Criminal Matters Amendment Act regarding infrastructure theft. The amendment places stricter measures for the granting of bail and the sentencing of offenders that are involved in infrastructure theft that negatively affects the provision of basic services to the public. We are confident that this amendment to the act will play a vital role in discouraging theft.

Electrification programs were ongoing during the year and we managed to connect in excess of 11 000 new customers to the grid. Despite the challenges in making these services available, the sheer smile on the customers face when receiving electricity for the first time, warms my heart and makes all efforts in overcoming these challenges worthwhile.

When I look back at the 2015/2016 financial year, I will agree that it was a year filled with important events. Some events motivated us, some events tested us but overall these events strengthened us. It is this strength that keeps in focus our mandate, of uplifting the lives of our people through the provision of services.
Our Department is responsible for the planning, construction, operation and maintenance of eThekwini Electricity's primary network of high voltage lines, cables and substations. The projects undertaken by this Department are to provide for increased bulk capacity and to improve the reliability of the region's electricity supply. The HV Operations Department is responsible for the planning, coordination and implementation of major projects, which may involve the construction and operation of substations, cables and high voltage lines. The Department prides itself in providing reliable, state-of-the-art solutions for the delivery of high-voltage power to our customers.
The HV Planning Branch is responsible for planning the unit's primary network of high voltage cables, lines, switching stations and substations. The timelines for providing HV infrastructure spans several years and therefore necessitates careful planning so as to ensure that there is sufficient HV infrastructure in place to meet the demand of all customers in a sustainable manner. The HV Planning Branch is the custodian of the transmission network master plan which is inclusive of a 20 year capital program that allows for HV network development, reliability requirements and refurbishment requirements. Analysis of the transmission network is carried out, using system analysis software for network load flows, voltage stability and fault level analysis. Key initial capital project life cycle processes; namely, application for Council funding, acquisition of land and servitudes, environmental impact assessment approvals and completion of preliminary designs are also completed by the branch.

**Highlights**

- Handed over the following to HV Projects Branch for execution:
  - Upgrade 132 kV Klaarwater-Hillcrest overhead line from Klaarwater Substation to Stockville Substation
  - Upgrade of 132/11 kV Kingsburgh Substation
  - Replacement of 132 kV cables from Rossburgh Substation to Congella Substation
  - Replacement of 132 kV cables from Grosvenor Road Sealing End Site to Dalton Road Substation
  - 132/11 kV Woodlands Substation

**Progress on existing projects**

- 132/11 kV Alice Street Substation - Preliminary design stage
- 32/11 kV Cornubia 1 Substation - Design proposal stage
- 132/11 kV Inyaninga 1 Substation - Preliminary design stage
- 132/11 kV Inyaninga 2 Substation - Preliminary design stage
- 132/11 kV Isipingo Substation - Preliminary design stage
- 132/11 kV Morelands Substation - Preliminary design stage
- 132/11 kV Moriah Substation - Design proposal stage
- 132/11 kV Longcroft Substation - Geotechnical studies
- 132/11 kV Sibiya Substation - Preliminary design stage
- 132/11 kV Verulam Substation - Land acquisition stage
- 132 kV Oil Filled Cable Replacement (CBD) - Preliminary design stage
- 132 kV Oil Filled Cable Replacement (Durban South) - Preliminary design stage
- 132 kV Verulam Switching Station - Land acquisition stage
- 275/132 kV Bellair Substation - Design proposal stage
- 275 kV Durban North Substation Yard Upgrade - Preliminary design stage

**Key challenges**

- Delays in obtaining clearance for new high voltage infrastructure in the immediate vicinity of King Shaka International Airport from Civil Aviation Authority
- Expansion of high voltage networks in the northern and western suburbs are dependent on Eskom's strengthening its network to the city, which risks delays due to resource constraints at Eskom

**Achievements**

- Updated HV network parameters on Digsilent software model
- Completed asset replacement programme for power transformers
- All HV Planning Engineers have attended the PLS CADD software training
- Geographical load forecasting model - 90% updated

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The HV Projects Branch is responsible for the detailed design and specification of equipment and management of major system reinforcement projects. There were 25 major projects in progress during the 2015/2016 year. The status of the projects at the end of the period under review is as follows:

- **Austerville 132/11 kV Substation**: New 132/11 kV substation aimed at relieving the aged 33/11 kV substations in the Jacobs area and further reinforcing the 11 kV network. Detailed civil design process in final stages.
- **Jacobs 132/11 kV Substation**: Addition of the 132 kV GIS to provide switching flexibility and reinforce the Jacobs 132 kV network by creating links between HV substations in the area. Civil designs completed and site works to commence.
- **Kingsburg 132/11 kV Substation**: The commercial and residential load demand in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Detailed electrical design in progress.
- **Kloof Substation 132/11 kV Substation**: New 132/11 kV substation aimed at replacing the ageing Kloof Substation and increasing reliability in the area. Detailed civil design in progress.
- **Rossburgh 132/11 kV Substation**: New 11 kV capacity to replace the 33 kV network that is being phased out. Civil designs completed and site works to commence.
- **Phoenix Industrial 132/11 kV Substation**: Replacement of the ageing and unreliable 11 kV switchgear, final testing in progress.
- **Klaarwater 275/132 kV Substation**: Upgrade current 250 MVA transformers to 315 MVA due to the increase in load. Procurement for the replacement of the other 4 x 250 MVA 275/132 kV transformers and associated equipment completed. Installation in progress.
- **Pinetown 132/11 kV Substation**: The commercial and residential load demand in the Pinetown, New Germany and Cowies Hill areas has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Final phase in progress.

**Highlights**

- Entire HV Projects Branch is involved in the detailed design and specification of equipment and management of major system reinforcement projects.

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HV PLANNING BRANCH

- Code generation load model - 90% updated
- All HV Planning Engineers have attended the PLS CADD software training
- Update HV network parameters on Digsilent model

**Acknowledgments**

- Expression of gratitude to our colleagues in the team and other individuals who contributed.
- King Shaka Suspension Bridge - a significant milestone in the immediate vicinity of the city.

**Key changes**

- Introduction of new high voltage infrastructure in the immediate vicinity of the city.
Newlands 132/11 kV Substation: The commercial and residential load demand in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Installed 2 x 30 MVA transformers and associated 132 kV equipment. Commissioned.

Blair Atholl 132/11 kV Substation: The commercial and residential load demand in the Westville area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Commissioned.

Ridgeview 132/11 kV Substation: The commercial and residential load demand in the Cato Manor area has increased and the 11 kV system needs to be reinforced. Commissioned.

Greenbury 132/11 kV Substation: The commercial and residential load demand in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. All primary plant has been installed and final testing in progress.

Umdloti Beach 132/11 kV Substation: The commercial and residential load demand in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Transformers previously relocated. New replacement transformers currently being installed.

Dalton Rd 132/11 kV Substation: The commercial and residential load demand in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Commissioning tests in progress.

Plangweni 132/11 kV Substation: Due to load growth the existing substation is required to be upgraded from 30 MVA to 60 MVA. Final testing in progress.

Jameson Park 132/11kV Substation: The commercial and residential load demand in the area has increased resulting in the need to upgrade the existing 33/11kV Substation and replace it with two new 30 MVA 132/11kV transformers and associated plant and equipment. Civil work completed. Installation of the 132 kV GIS in progress.

Umlazi 132/11 kV Substation: The commercial and residential load demand in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Pre commission testing in progress.

Durban South 275kV Bus Section: Required to improve the security of supply at this strategic substation. Installation of plant and equipment pending network constraints.

K E Masinga 132/11 kV Substation: The commercial and residential load demand in the city area has increased and the 11 kV system needs to be reinforced. Installation of plant in progress.

Springpark 132/11 kV Substation: The commercial and industrial load demand in the Springpark area has increased and the 11 kV system needs to be reinforced. Civil works in progress and plant has been ordered.

Bulwer 132/11 kV Substation: The commercial and residential load demand in the Glenwood area has increased and the 11 kV system needs to be reinforced. Civil works in progress.

Underwood 132/11 kV Substation: The commercial and residential load demand in the Pinetown area has increased and the 11 kV system needs to be reinforced. Civil works in progress.

La Mercy 132/11 kV Substation Reinforcement: The commercial and industrial load demand in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Installation of additional transformers in progress.

Stockville 132 kV Switching Station: New switching station proposed to feed the new proposed substation in the Mahogany Ridge and Kloof areas. This switching station will also feed the existing Westmead, Marrianridge, Hillcrest and Waterfall Substations which will eliminate security risks and operational limitations which apply to existing circuits. Detailed civil design in final stage.

Mahogany Ridge 132/11 kV Substation: The commercial and residential load demand in the Westmead and Mahogany Ridge areas has increased and the 11 kV system needs to be reinforced with additional capacity (60 MVA firm). Detailed civil design in final stage.

Lowlights

Early retirement of the Senior Manager who was at the helm of this Branch for over 20 years.

Key Challenges

- High vacancy rate in the department. This limits the department’s ability to run many projects concurrently.
- Theft of materials such as copper at brownfield sites is on the rise and sometimes delays the projects significantly due to long lead times of replacing certain items.
- Increased trend of communities rioting for increased quotas of local labour and bringing construction projects to a halt. This delays project progress.
- Network constraints dictate the availability of existing plant and sometimes affect progress at brownfield sites.

Future Focus

- Acceleration of the replacement of oil filled underground cables constituting the bulk of the city’s cable network to be completed before 2022.
- Completion of all projects that are in the final stages.
- Filling of vacant posts for resources required for site supervision of projects in order to improve on implementation.

New Technologies

- The following low maintenance technologies have been introduced on new high voltage transformers:
  - Vacuum Tap Changers
  - Dehydrating Breathers
  - Resin Impregnated Bushings
The HV Substation Branch is responsible for the operation and maintenance of equipment that has been decommissioned or has reached the end of its useful life. This includes transformers, circuit breakers, instrument transformers, isolators, lightning masts, and power line equipment. The branch is responsible for transforming energy from 275 kV to 132 kV, 132 kV to 33 kV, and 11 kV, and then transforming 33 kV to 11 kV. The branch collaborates with Eskom to import energy at 275 kV.

The branch has made significant progress in reducing the maintenance backlog. In 2016/2017, the branch increased tactical maintenance by 17% compared to the previous year. This was achieved through better understanding of key performance indicators and a strategic approach to workload management. The branch also focused on the timely return to service of five strategic transformers, ensuring equipment availability.

Key Challenges:
- **Copper Theft**: The branch has observed an increase in copper theft incidents in high voltage substations, posing a threat to equipment functionality.
- **CCTV Installation**: There has been a delay in the installation of CCTV cameras to deter copper thieves.
- **Maintenance Backlog**: The branch is implementing strategies to decrease maintenance backlog.
- **Spares Policy**: The branch is working on developing a strategic spares policy to enhance equipment reliability.
- **Organogram Changes**: The branch is seeking to secure additional posts through proposed organogram changes.
- **Critical Vacancies**: The branch is addressing critical vacancies to boost productivity and effectiveness.
- **Efficiency**: The branch is striving to improve efficiency in work order backlog management.
- **Service Level Agreements (SLA)**: The branch is finalising SLAs with Original Equipment Manufacturers (OEMs) to ensure specialist skills are provided.

Future Focus:
- **Safety**: The branch is prioritising safety and quality in its operations.
- **Technology**: The branch is implementing new technologies to enhance equipment performance.
- **Training**: The branch is investing in staff training to enhance skills.
- **Research**: The branch is conducting research to improve equipment maintenance and reliability.

Key Results:
- **Equipment Failures**: There was a significant decrease in catastrophic failures of equipment compared to the previous year.
- **Maintenance Schedule Attainment**: The committed maintenance backlog was reduced by 11%.
- **Efficiency**: The branch achieved an improvement of 51.65% in maintenance schedule attainment from 2014/2015 to 2015/2016.
- **Tactical Maintenance**: The proportion of tactical maintenance increased from 46.04% in 2014/2015 to 58.54% in 2015/2016, contributing to a reduction in breakdowns.

The branch's focus is on improving maintenance efficiency, reducing the maintenance backlog, and ensuring timely return to service of critical equipment.
The HV Lines Branch is responsible for the operation and maintenance of the high voltage overhead lines network consisting of 141 circuit kilometres of 275 kV, 478 circuit kilometres of 132 kV and 13 circuit kilometres of 33 kV overhead line.

**Key Priority Projects**

- Refurbishment of the following assets:
  - Ottawa-Parlock 132 kV Double Circuit Line: Painting of structures and re-insulation
  - Bellair-Rossburgh 132 kV Double Circuit Line: Foundations refurbishments
  - Re-design of Klaawater-Umgeni 132 kV Double Circuit Line for upgrade with High Temperature Low Sag Conductors (HTLS)
  - Design of Klaawater-Hillcrest 132 kV Double Circuit Line for upgrade from single to twin ELM.
  - Detailed condition assessment for the determination of the remaining life of existing 132 kV and 275 kV overhead lines and needs analysis for refurbishment.
  - Procurement of new contractors for the refurbishment and the construction of 132 kV and 275 kV overhead lines of which actual work will commence in 2016/2017 financial year.

**Key Challenges & Mitigations**

- Encroachment of asset servitude and corridors still remain the highest risk to the infrastructure: This challenge need proper enforcement of Municipal laws and policies.
- Maintenance backlog has increased due to the delay in staff appointments.
- Inability to meet employment equity targets hence results in an increase in vacancies: A program to train and upskill personnel, specifically the target group as per the employment equity plan will need to be developed and implemented urgently.
- Suitable off road (4x4) vehicles is a challenge as the access roads are becoming more difficult to navigate with the encroachment of informal settlements and developments within the power line corridors: This will be mitigated by working with Transport Branch to procure suitable vehicles.
- Maintenance of access roads and vegetation: Vegetation management contractors have been appointed to assist with the implementation of the vegetation management plan.
- Faults resulting from lightning strikes: Studies to be conducted on the lightning performance of the HV Lines infrastructure.

**Highlights**

- Steel theft has been reduced significantly with the success of the construction and refurbishment contract.
- Steel theft has been reduced significantly with the success of the monitoring system.

**Future Focus**

- Execute the Klaarwater-Umgeni 132 kV Double Circuit Line upgrade project.
- Procure and install more tower steel theft monitoring devices.
- Focus on access roads maintenance and Vegetation Management plan implementation.
- Continue with Asset Refurbishments project.
- Participate on national and international technical platform to learn and share knowledge with other utilities.

The HV Cables Branch is responsible for the operation and maintenance of 132 kV, 33 kV, and 11 kV cable assets which form part of the primary network.

The maintenance of pressurised gas and fluid-filled cables continues to be a problem. A number of leaks have been located and repaired on several strategic cables which have now been in service in excess of 40 years. Several cables have also been decommissioned with the new 132 kV substations in operation.

Several 33kV circuits have already been decommissioned with the new 132kV substations being commissioned. Focus now is on the decommissioning of the problematic gas filled cables feeding Huntleys.

In addition to the above, three 132kV substations, Ridgeview Quarry; Mondi and SAPREF have been commissioned. Ridgeview will alleviate the loads from Huntleys 33/11kV substations in the near future. This will eventually allow the decommissioning of the problematic gas filled cables feeding Huntleys.
The Network Control Branch comprises of four Divisions: HV Network Control, System Performance, Network Management and Control Systems.

The HV Network Control Division is responsible for the safe operation and efficient performance of the High Voltage Network, which incorporates a 24-hour, manned HV network control centre with remote control and alarm facilities. Durban's primary transmission network, being the supply from 275 000 V, is monitored and controlled from this network room, using a sophisticated Supervisory Control and Data Acquisition (SCADA) system.

The System Performance Division is responsible for network optimisation, ensuring the HV Network can meet the demand for electricity, statistical reporting and quality of supply to the bulk supply points for the 11 000/6 600 V distribution system and large industrial customers that are connected directly to the HV network.

The HV Network Management and Control Systems Divisions are responsible for the installation and maintenance of systems that are required for the efficient monitoring and control of the Unit's critical infrastructure.

Highlights

- The Branch has successfully deployed a fully interconnected diagram of the HV network for control operations. This allows operators to have a clear overview of the entire HV network of eThekwini.
- The Branch has successfully achieved better than 99% uptime of the SCADA system in-line, with international standards for Operations Technology (OT) availability. This is partly due to the replacement of legacy equipment with newer leading edge technology.
- The Branch has increased its SCADA visibility of HV substations to 97%, bringing it up by 7% since last year.
- Through the successful development of an alarm management philosophy, the Branch was able to reduce the daily SCADA alarm count by 45%. This increases operator effectiveness in controlling the HV network.
- As per the requirements set out by Eskom and NERSA, HV Network Control have designed eThekwini Electricity's black start plan, which will assist Eskom to start up the national grid, should there be a national blackout.
- The Branch has developed a cane fire management programme where it is expected that the implementation of this programme will reduce the number of cane fire related faults on the network.

Challenges

- Staffing of the HV control room continues to be a major concern. The Branch is currently investigating the application of remote working (OT) technologies to improve the efficiency and effectiveness of its operations.
- The Branch is currently investigating the application of Internet of Things (IoT) technologies to increase grid visibility at remote sites.
- The Branch is in the process of acquiring the latest power quality instruments and advanced software to manage power quality in near real time. This will improve situational awareness and decision making in the Control Centre.

New Technologies

- The Branch is investigating a Fault Detection Isolation and Restoration (FDIR) tool to limit and prevent the amount of load lost when a network fault occurs. This will allow for a higher volume of maintenance work to be carried out on the network while allowing for a better overview of network conditions. The network has been configured so that a fault on one HV line will not affect the other HV lines on the network.
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Planning, construction, operation and maintenance of medium and low voltage networks.

The MV/LV Operations department is responsible for the planning, construction, operation and maintenance of the Unit’s medium and low voltage network. The Department plays a major role in connecting new customers to the electrical grid, thus helping to spread electrical services to all sectors of the Community. The Department is also responsible for providing public and street lighting and for introducing new and improved energy efficient lighting technologies into the City.

Furthermore, the Department manages and controls all medium to low voltage substations.

Advancements in technology with the benefit of cost/operational optimization are driving significant changes in the electricity supply industry and the MV/LV Department is strategically embracing these advancements to improve the overall operation, stability and reliability of the Network.

Senior Manager:
- Maintenance
- Construction
- Planning and Works
- Lighting Planning
- Lighting Works

Manager:
- Lighting

MV/LV Operations

Planning, construction, operation and maintenance of medium and low voltage networks.
CONSTRUCTION PLANNING AND WORKS BRANCH

Connections to housing projects, transit facilities, informal settlements and rural areas has reduced the backlog of dwellings without electricity from 27.56% to 26.24%. During the year 11,424 prepaid connections were completed at a cost of R93m. The Department of Energy, through the Integrated National Electrification Program, provided R30m to electrify 3,298 of these dwellings. A further 46,000 people can now enjoy a better life.

An amount of R135m was spent on supplying electricity to new commercial, industrial and non-prepaid residential customers. A total amount of R263m was spent on capital projects. Some of the major projects include:

- Commissioning of new 11 kV distribution substations
- Replacement of ageing medium voltage switchboards
- Laying of cables from Pinetown Major
- Laying of cables from Ridgeview Major
- Installation of new infrastructure to Cornubia Industrial Estate
- Installation of new infrastructure to Cornubia Housing
- Relocation of services to accommodate the Bus Rapid Transport

Lowlights

The year was a very challenging one. We experienced delays in awarding of service contracts. Delays in obtaining material also hindered service delivery. Protests and work stoppages led to further delays. Even in claiming material also prolonged service delivery. Problems and work stoppages led to further delays. Even with these constraints staff and contractors put in a lot of effort to satisfy our customers.

Key Challenges

The Construction Planning and Works Branch has a number of technical and supervisory posts vacant. The Branch utilises the services of Consultants to process applications for new connections, and manage the installation of service connections. Consultants have continued to complement our staff in addressing the backlog of service connections. Consultants have continued to complement our staff in addressing the backlog of service connections. Consultants have continued to complement our staff in addressing the backlog of service connections. Consultants have continued to complement our staff in addressing the backlog of service connections. Consultants have continued to complement our staff in addressing the backlog of service connections. Consultants have continued to complement our staff in addressing the backlog of service connections. Consultants have continued to complement our staff in addressing the backlog of service connections. Consultants have continued to complement our staff in addressing the backlog of service connections.

Lowlights

The Maintenance Planning and Works Branch is responsible for inspection, maintenance planning and maintenance implementation on all medium and low voltage apparatus as well as repair of distribution and maintenance of eThekwini Electricity's distribution network is vital in ensuring the integrity and reliability of supply to our large customer base. This Division, high standards and strives to comply with various national standards and the Power Quality Charter in order to meet the requirements of customers.

This Branch comprises of six Regional Maintenance Works Depots and a Maintenance Planning Division based at the Electricity Headquarters. The Branch consists of a Senior Manager, Managers, Specialist Engineers, Technicians, Electricians and the various levels of administration and assistant staff.

Highlights/Lowlights

The major challenge facing the Division is the growing pandemic of theft and vandalism of electrical infrastructure. The growing global need for non-ferrous metals such as copper has resulted in high volumes of theft of electrical infrastructure both locally and abroad. The result of theft is a significant increase in the workload of maintenance staff and infrastructure.

Ten electricians left the branch which negates the productivity of the branch. Slow progress with the filling of vacant posts also contribute negatively to the branch. Challenges with procurement and servicing of vehicles and trucks affect productivity of the branch. Theft of copper conductors and damaging of the infrastructure by third parties compromise the quality of supply to our customers. The Division has undertaken an aggressive recruitment drive during the year under review to bolster its internal resources and reduce reliance on external service providers.

The rapid growth of the electrical network coupled with the shortage in human resources and an increase in stature, has resulted in significant backlogs of planned and preventative maintenance work. The Division has undertaken an aggressive recruitment drive during the year under review to bolster its internal resources and reduce reliance on external service providers.
The change in maintenance cycle is expected to increase the Tactical Maintenance Work Order backlog. Based on findings and recommendations of past investigation reports and in the interest of safety to personnel, the Division has decided to change the maintenance cycle of the Reyrolle LMS switchgear from 5 years to 1 year. This decision is in line with the principles of condition-based preventive maintenance, which is aimed at improving system reliability and reducing maintenance costs.

Key Challenges

- **High Rate of Failure**: Over the past 10 years there has been a high rate of failure on the Reyrolle LMS switchgear installed on the distribution network of eThekwini Electricity. These failures have presented an extremely hazardous situation due to the critical nature of the switchgear in maintaining power reliability and safety. The Division is addressing this challenge by implementing condition monitoring and detection technologies.

- **Partial Discharge Measurement**: The Division is exploring the use of partial discharge measurement techniques to detect early signs of switchgear degradation. This involves the installation of sophisticated equipment to monitor switchgear health.

- **Infrared Imaging**: The Division has plans to procure infrared cameras for detecting hot spots and SF6 leaks in the distribution network equipment. These cameras will help in identifying potential failures before they escalate into major issues.

- **Exothermic Welding**: The Branch in conjunction with the supplier is planning to send branch engineers abroad to obtain skills on partial discharge measurement techniques and switchgear health index based on partial discharge. The Division also has plans to procure two partial discharge detection equipment for use in the field.

- **Auto-reclosers and Sectionalisers**: The Division has replaced over 60 auto-reclosers and over 40 sectionalisers in the 2015/16 financial year with the aim of not only replacing due to age and reliability but also because of Smart Grid requirements and public safety. The Branch has also procured four exothermic welding equipment and recommended the use of Copper Clad Steel (CCS) and in particular, discoloured CCS (Camo), as a suitable replacement for earthing. The Branch has spent R200 000 on a pilot project to install and evaluate the performance of Copper Clad Steel earthing conductor project.

- **Lighting Maintenance Planning**: The Branch has filled 95% of posts within its structure and continues to work on building their skills and capacity. Various appointments were made at all levels and the staff vacancy levels have significantly reduced. The technical staff will however, need to go through a mandatory pre-competency period before they are deemed to be fully functional and are able to work independently.

- **Streetlighting Projects**: Other significant projects include: building and lighting for all High Voltage (HV) substations is currently being audited and upgraded in a phased approach. The Division is looking into various funding options, including EEDSM, Department of Energy, Swiss and German donor funding.

- **Integrated Public Transport Network (IRPTN) Projects**: Other major projects for the current and future financial years include; Bridge City to Pinetown on the N2, Umgeni Road/Illovu Road (Kwamashu), Umgeni Road/School Road (Verulam), M4 Ruth First Northern Interchange, completion of MR 577 (Kwadebeka), School Road (Verulam), M4 Ruth First Northern Interchange, completion of MR 577 (Kwadebeka), School Road (Verulam), M4 Ruth First Northern Interchange, completion of MR 577 (Kwadebeka), School Road (Verulam), M4 Ruth First Northern Interchange, completion of MR 577 (Kwadebeka), School Road (Verulam), M4 Ruth First Northern

- **Copper Clad Steel (CCS)** and in particular, discoloured CCS (Camo) are being considered for the replacement of earthing. The Division is undertaking testing and evaluation of Copper Clad Steel earthing conductor project.
E.9320: Supply, delivery and off-loading of decorative Christmas lighting material for Dr Pixley KaSeme
E.9216: Supply, delivery, off-loading, installation and commissioning of solar energy powered light
E.9312: Supply, delivery and offloading of photoelectric control units and associated items during a
E.9280: Supply, delivery and off-loading of steel frames, galvanised steel enclosures, Photo-Electric

The following contracts totaling R 189 320 000 were handled by this division:
Procurement Forum as well as the Bid Specification, Bid Evaluation and Bid Adjudication Committees.

Lighting Research & Investigation Division:
for these entities, and takes into account any specific requirements for each of them.
external electrical consultants. The branch plans and designs conventional and special lighting projects
& Cemeteries, Roads and Stormwater, Strategic Projects, Tongaat Huletts and a host of developers and

Many of the projects undertaken by the branch involves liaison and interaction with other units within
Road. Vusi Mzimela Road, Mapangele Drive, M7/M14 Emhlabeni, Syringa Road and Chris Hani
Grove, Umzinyathi Sportsfield, John Dory Sportsfield, Drewstead Road, Kashmiri Street, Flame

The following major capital projects were completed; Acacia Crescent, Walter Perfect Road, Sunset
Introduced mSCOA requirements onto capital projects as required by National Treasury.

Increased illumination levels at the following 132/11 KV substations due to theft of infrastructure;

Installed in excess of 500 LED streetlights mainly in the 36 W range to replace the 80 W HPMV

Dilkoosh Road, Granada Street, Simla Street, Cathedral Street, Helwin Street, Chicory Road,
following roads; Umdloti Main Road, Marievale Road, Kies Avenue, Ocean Terrace, Bilberry Avenue,

Redesigned street lighting circuits by removing 9m gum poles and replacing with 9m steel poles

A total of 770 lighting installations inspected in Eskom areas
Identified 610 hazards in beaches
Bulk lamping routes of 104 866 installations inspected
Sport fields totaling 631 Inspected and reported
Highway Inspections totaling 7895 were done, identified hazards and reported.

Maintenance division has inspected total of 114002 lighting installations
Inspections of sport fields, park and footpaths.

Continuous research and investigation is required for adequate control of the
Lighting Research & Investigation Division:

Over the past financial year these were the findings:
Inspections of sport fields, park and footpaths
High mast inspections along the beaches, townships and roads
Pole testing of all poles along highways, freeways and major routes
Preventative maintenance due to identifying and hazards and repairing and redesign in advance
Continued inspections of sport fields, park and footpaths to identify hazards
Installation of additional lighting to assist with these challenges. A summary of the divisions activities is

E.9292:  Supply, delivery and off-loading of electrical discharge lamps and incandescent electric lamps
E.9194:  Supply, delivery and off-loading of street light and floodlight luminaires during a thirty six
E.9233:  Supply, delivery, off-loading and stacking of steel street-lighting poles during a twenty four
E.9199:  Supply, delivery, off-loading and stacking of pre-stressed and reinforced concrete poles
E.9364:  Removal and disposal of potentially hazardous lamps during a twenty four month period.
E.9334:  Painting of steel poles, arms and attachments during a twenty four month period. R 2M
E.9234:  Painting of steel poles, arms and attachments during a twenty four month period. R 6M.
E.9004:  Painting of steel poles, arms and attachments during a twenty four month period. R 4M
E.9284:  Painting of steel poles, arms and attachments during a twenty four month period.
E.9254:  Painting of steel poles, arms and attachments during a twenty four month period.
E.9394:  Painting of steel poles, arms and attachments during a twenty four month period.

E.9192:  Supply, delivery and off-loading of fluorescent light with ballasts during a thirty six month period.
E.9193:  Supply, delivery and off-loading of incandescent lamp during a thirty six month period.
E.9262:  Supply, delivery and off-loading of metal halide lamp during a thirty six month period.
E.9263:  Supply, delivery and off-loading of metal halide lamp during a thirty six month period.
E.9264:  Supply, delivery and off-loading of metal halide lamp during a thirty six month period.
E.9265:  Supply, delivery and off-loading of metal halide lamp during a thirty six month period.
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E.9280:  Supply, delivery and off-loading of metal halide lamp during a thirty six month period.
E.9281:  Supply, delivery and off-loading of metal halide lamp during a thirty six month period.
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E.9290:  Supply, delivery and off-loading of metal halide lamp during a thirty six month period.
The benefits of telemanagement are summarized below:

- Dimming capability
- Adjustable on/off timing
- Lamp failure detection
- Energy consumption monitoring
- Open circuit detection
- Lamp-burning hours monitoring

The Owlet lighting telemanagement system is used to manage, control, monitor and meter outdoor lighting systems. The main objectives of the system are to reduce greenhouse gas emissions, reduce energy consumption, improve reliability and minimize maintenance costs. Individual lighting points can be controlled and the system is based on open technologies. A central repository collects and stores date and time stamped critical information such as energy consumption, operating states and failures which could also be geographically categorized.

LED Streetlighting:

The use of LED for various applications has increased exponentially over the past few decades and is even being hailed as the future of lighting by many. Suppliers and manufacturers are claiming various advantages which include a compact size, longer life spans, lower maintenance, improved design capabilities, color rendering features and increased luminous efficacies, amongst others. LEDs are changing the tradition of photometry and are being continuously improved to maximize benefits.

The benefits of LEDs are as follows:

- Lower energy costs
- Reduce power consumption
- Improved controllability
- Improved lumen constancy
- Longer life
- Predictable life span
- Redirection of light emissions
- Improved reliability
- Environment friendly
- Quick turn on/off
- Dimming capability

The following table shows the cost and energy saving breakdown when converting to LED:

| QUANTITY ROAD EXISTING LED ENERGY ACTUAL TOTAL PER UNIT TOTAL IN |
|---|---|---|---|---|---|---|
| STREETLIGHT WATTAGE (INCL VAT) | 2 888 B1 80 W HPMV 69 W LED 35% 33 W | 95.3 kW | 3 692.97 | 10 665 306 |
| 974 A4 150 W HPS 88 W LED 50% 91 W | 88.6 kW | 4 270.12 | 4 159 098 |
| 971 A3 250 W 148 W LED 46% 130 W | 126.2 kW | 5 329.97 | 5 175 398 |

Lighting Works Branch

The Branch welcomed four female pre-competent electricians who have just passed their general streetlighting competency so as to work independently.

The old fleet was replaced with eight new trucks.

The Branch maintained a five star NOSA rating as per DFIIR report on Health and Safety Environment.

Contract E9275 for construction and maintenance of streetlighting network started and is for a duration of 2 years.

Operational budget was within the budgeted parameters.

Completion of the Bridge City project by internal staff during a limited resources period.
Lowlights

The theft of cables and cutting of streetlight poles.

Meeting equity in the recruitment process renders filling of posts very challenging.

Delays in acquiring materials due to procedural policies.

Key Challenges

Improving the cable fault location skills of our electricians as well as looking at ways to secure the streetlighting infrastructure especially along the main roads and highways.

Management would like to acknowledge staff in the branch for their efforts and dedication in keeping the lights burning during the challenging times.

NETWORK CONTROL BRANCH

As part of MV/LV operations the Network Control branch is responsible for the 24/7 running of the electrical network, monitoring and controlling planned and unplanned outages.

The electrical network in eThekwini spans more than 2000 square meters and serves in excess of 734 000 customers. The network is closely monitored around the clock by Control Officers in our dedicated control center. The Control Officers optimize the allocation of resources, identify risks, prioritize safety and manage load flow throughout the electrical network. We have dedicated teams of Field Crews and external contractor teams that work in unison with the Control Officers. They strive to promptly facilitate the coordination of outage restoration, as it directly impacts on the quality of life to our citizens.

While we always intend to ensure an acceptable quality of supply and service to our consumers, there are certain factors beyond our control which adversely impact the performance of our service delivery. The high rate of illegal connections, damage to equipment from severe weather conditions and theft of infrastructure on the electrical network remain an ever increasing challenge.

Significant progress is being made in improving our outage response times with the implementation of multiple devices and systems that will eventually enable us to bring much needed transformation to the electric grid. A Smart Grid enables vastly improved system reliability.

Network Control is in the implementation phase of one of the components of a smart grid system. The Advanced Distribution Management System (ADMS) is a software platform that supports the full suite of distribution management and grid optimization. An ADMS includes functionality that automate outage restoration and improve the performance of the distribution grid. The ADMS functions developed for electric utilities include fault location, isolation and restoration.

Network Control plans to deploy Distribution Automation as part of the Smart Grid Initiative to improve reliability, efficiency, asset utilization and performance of the electric distribution system. Distribution automation is an integration of technologies and protocols that can remotely control and monitor the electrical distribution system operations. Distribution automation enhances the quality of supply by allowing the faults team to locate faults earlier and easier. Field staff are dispatched quicker to attend to faults, therefore reducing the outage times. The data acquired from site also assist the controllers to identify if and when the network is under stress and can reconfigure the system to optimize the network.

Network Control also provides dedicated teams of standby staff for special events. Our staff works behind the scenes to ensure a stable power supply and backup power in the event of a power disruption.

Future Focus

In the year ahead Network Control seeks to improve our service to our customers by embarking on an extensive capital investment program. In the year ahead Network Control seeks to improve our service to our customers by embarking on a capital investment program.

The Quality Improvement (QI) program and the various of QI had a positive impact on the performance of our service delivery. The QI program and the various of QI had a positive impact on the performance of our service delivery.
The Technical Support Department provides a diverse range of technical services to support the Unit. This includes managing and providing specialist services within the Electricity Unit. The department comprises seven branches, namely Communication Networks Branch, Electrical Workshops Branch, Mechanical Workshops Branch, Network Drawing Office Branch, Production and Test Branch, SHERQ & Training Branch, and Technology Services Branch. Collectively, these Branches ensure that all resources are effectively and efficiently utilised so that value is added to approximately 730,000 customers that the Electricity Unit currently supplies.

Manager:
- Electrical Workshops
- Mechanical Workshops
- Network Drawing Office and Survey
- Protection and Test
- SHERQ and Training
- Technology Services
- Communication Networks
- Protection and Test
The Communication Networks Branch is responsible for providing and maintaining secure and reliable communication links for all technical systems that monitor, control and protect all electrical plant and equipment in the HV transmission and MV distribution networks from which all customers are supplied. In addition, the Branch provides communication channels for other support services required to operate an electrical utility, such as Information Technology (IT) wide area network (WAN) links, closed circuit television (CCTV) and access control, as well as support municipal communication requirements where possible.

This is achieved by researching, designing, planning, procuring, operating and maintaining the required communication networks that ultimately enhance the security and quality of electricity supply in the most effective manner and provide other users with communication links for the effective operation of their systems.

Routine activities include:

- Planning, acquisition, installation and commissioning of fibre optic, data, wireless and copper pilot communication network links, customised dust proof equipment/termination panels, ruggedised carrier class DWDM and SDH access multiplexers, optical switches/routers/media converters, GPRS cellular radio modems, wireless communication equipment and protocol converters at substations/other sites; to enable the commissioning of SCADA, Protection, Security/Access Control, Telephone, IT and City systems by set deadlines.
- Location of all communication link and system equipment failures and restoration of critical user system services/operations.
- Maintenance and repair of all communication links and system equipment to ensure continuous reliable operation of critical user systems.

Highlights:

- **Protection, Automation and Control (PAC) World Conference**
  - The Communication Networks Engineering Division in conjunction with the Protection Engineering Division drafted and presented at paper at the Protection, Automation and Control (PAC) World Conference. The conference was hosted in Johannesburg between 12 & 13 November 2015. The paper was entitled “Application of IEEE C37.94 Standard for Interfacing a Two Terminal Differential Protection Relay Pair to SDH Multiplexor Equipment.” The paper investigated the application of the IEEE C37.94 standard for interfacing a two terminal current differential relay pair to existing synchronous digital hierarchy (SDH) multiplexor equipment installed on the fibre optic backbone network. Furthermore, the failover mechanism of the primary communication channel to the secondary communication channel was discussed.

- **2015 UNESCO Africa Engineering Week**
  - Staff participated in the 2015 UNESCO Africa Engineering Week. The event was hosted at the Mangosuthu University of Technology.

- **New and exciting projects undertaken**
  - **Mini-Smart Grid pilot project proposal**
    - The mini-smart grid pilot project was suggested in order to provide direction in solving the above challenges. A project proposal report was successfully completed. It was decided by the Chairman of the Smart Grid Workgroup and the Chairman of the Advanced Transmission and Distribution Solutions Committee to proceed with implementation.
  - **Installation of fibre optics to distributor substations**
    - A decision was taken that Fibre Optics was the preferred communication medium for Distributor substations. The Communication Networks Branch was mandated to develop a proposal for the installation of fibre optics to distributor substations. A project team was established to implement the project.

The scope of work for the 2015/16 financial year included:

- Implement internal branch process for the identification of fibre optic installations
- Plan fibre optic installations DLs for 2016/17
- Update MV Planning on the latest fibre optic installation practices
- Recommend DL design changes to MV Planning
- Implement DL Review/Revision request system
- Integrate fibre optic installation work into construction management systems
- The communication networks branch is responsible to provide and maintain secure and reliable communication network links for all technical systems that monitor, control and protect all electrical plant and equipment in the HV transmission and MV distribution networks from which all customers are supplied.
ELECTRICAL WORKSHOPS BRANCH

This Branch was established to ensure that all equipment received, from the manufacturers, is tested prior to installation into the Electricity Network. It has been responsible for repairing equipment which has failed while in service. This Branch is also responsible to supply other departments with mineral oils which are utilized as coolant medium in the transformers, autoreclosers, etc. Over the years this Branch has evolved to undertake specialised intrusive maintenance on MV switchgear and transformers.

Routine activities

- Acceptance testing on all new equipment purchased, ie. Mini substations, transformers, ring main panels, autoreclosers, sectionaliser and motors in the workshop or site, prior to it being handed over to stores.
- Repairs and overhauls to transformers, mini substations circuit breaker in the workshop or on site.
- Provide a breakdown service to attend to faulted transformers, mini substations, circuit breakers, autoreclosers and sectionalisers within the MV/LV Operations network either on site or in the workshop.
- Oil processing is carried out to provide MV/LV Operations and HV Operations with regenerated transformer oil which ensures the effective management of the processing, storage and issuing of regenerated transformer oil.
- Reclamation of waste and scrap is carried out by the reclamation division. The disposal of cables which have returned from site due to failure or new network developments is processed by this division. These cables are cut into 1 metre lengths to prevent being utilised unlawfully.

Highlights / Lowlights

- Research and development into test methods for new equipment has lead to improved quality control at the Electrical Workshop. During a trend analysis it was highlighted that we were experiencing a large failure rate of the secondary circuit feeding the analog ammeters found on the mini-substation units received from the contracted supplier. It was then decided to revise the current test procedure by introducing an additional test on the secondary circuit of the mini-substation. To conduct this test successfully, additional test equipment had to be procured. The standard test procedure was successfully revised, resulting in a reduced number of secondary circuit failures on equipment.

New and exciting projects undertaken

- Due to the rising cost of electrical energy, it was decided to investigate methods to reduce the energy consumption within the oil processing division at the Oil Store. A load profile was conducted for equipment within the work area, due to the results it was decided to introduce pneumatic pumps for the transfer of oil. This also introduced the challenge of providing sufficient compressed air with reduced moisture content. After careful plan and design, a compressor was purchased to pump air into a network of pneumatic lines to feed the oil pumps. The benefits are largely visible with reduced costs and better operational capability.

- Large number of electrical equipment are manufactured with electronic control panels. This brought about the need to develop the skills and introduce a dedicated Electronics Test Bay to conduct testing and repairs to electronic panels. For these tests, specialized equipment had to be researched and procured, these include Oscilloscopes, accurate read out meters and precise power supply units. Staff will require on-going training to ensure the project remains a success.

CHALLENGES

- As the design of electrical equipment continuously evolves, effective training and updating of procedures become essential to provide a quality service. Mechanism for skills transfer and training needs to be constantly reviewed and evaluated to ensure challenges are overcome.

Achievements and awards

- Two Electricians specializing in switchgear repairs successfully completed the test and was deemed competent.
- One Electrician has successfully completed a transformer competence test.

MECHANICAL WORKSHOPS BRANCH

Mechanical Workshops Branch provides a specialist mechanical support service to the Electricity Unit. These are the Work Programming Division, Fitting, Machining & Rigging and Welding Workshops. The Branch is involved with a wide range of repetitive fabrication, production and maintenance, and also a diversity of mechanical tasks that change on a daily basis as per our customer’s requirements, in line with our function of being the mechanical support function to our electricity distribution network.

Routine activities

- Costing, planning, design, research and purchasing of materials and equipment for works orders received.
- Manufacturing of galvanized equipment, repairs to fibreglass ladders, maintenance and fabrication of electrical equipment, installation of support structures, rigging services and safety inspections.
- Repetitive production work, maintenance, manufacturing and repair of electrical infrastructural equipment and component fabrication.
- Maintenance of ISO 9001 accreditation by ensuring successful audits.
- Practical training of Mechanical Apprentices.

New and exciting projects undertaken

- Structural supports for piping equipment - K. E. Masinga Substation
- Training staff on the rigging HV equipment
- Support the electrification of informal settlements by manufacturing 30 000 pre-payment brackets.
Challenges

Ventilation equipment installations - Welding Workshops
Recertification of SANS 9001:2008 Management System
A further manufacturing of 18 000 pre-payment units to support the electrification of informal settlements

Achievements and awards

Re-accredited with ISO 9001

NETWORK DRAWING OFFICE AND SURVEY BRANCH

The Network Drawing Office and Survey Branch is a support Branch to the Electricity Unit, comprising six Divisions, namely Administration, Network Records, Geographic Information Systems (GIS), Special Projects, Utility Plans and Survey Services. The main focus of the Branch is to maintain an accurate geo-spatial representation of all Underground and Overhead electrical assets in a connected network, provide an efficient GIS, to support other enterprise systems and first line GIS User Support to all GIS Users and to provide a Survey service, within the Electricity Unit.

Routine activities

The Administration Division provides an administrative service to the six internal Divisions and, a printing and scanning service, to the Electricity Unit and external Service Providers that are contracted to the Unit. The Division also scans all as-built documents to an image repository. The Special Projects Division uses CAD technology to update and maintain the Low Voltage Circuit Diagram database and make these diagrams available via a web browser. This Division produces design and documentation for the Unit and also updates the code of practice, drawings and illustrations, for the Technology Services Branch.

The Survey Division provides survey services to internal and external customers by:

a) Surveying property and servitude boundaries to avoid encroachments,
b) Surveying overhead line, underground cable and equipment location for GIS update,
c) Locating cable and pole encroachments for insurance claims,
d) Tracing cables for accurate cable location.

The Network Records Division is responsible for maintaining an accurate geo-spatial representation of the Underground and Overhead Electrical Network in the GIS to provide information for other systems. The Division also provides Depot Draughtspersons at the Unit's Construction and Maintenance Depots, to assist the technical staff by providing reticulation information from the GIS.

The GIS Division is the custodian of the ArcGIS enterprise database. Its primary function is to ensure data integrity and makes available the ArcGIS Server web browser to all employees. This Division also provides GIS support services to all staff in the Unit and provides specific GIS software applications to assist other Branches in some business processes.

The Utility Plans Division attends to all way leaves, provides network information to visitors and responds to all written correspondence received by the Branch.

Highlights / Lowlights

Completed all CAD drawings for the Overhead Mains (OHM) Codes of Practise, for the Technology Services Branch
Surveyed 16 Informal Settlements and Transit Camps with a total house count of 5 376 Units in 2015/2016
Completed the upgrade of the ArcGIS Server to serve out the connected network and various other datasets.
Upgraded the Planning Applications module on the ArcGIS Server to assist Customer Services to obtain a suitable Property Key for the migration of Customers to the Revenue Management System (RMS).
Modelled 92% of the outstanding MV sites in the GIS.
Completed the upgrade of the ArcGIS Server to serve out the connected network and various other datasets.

Challenges

Contribute survey resources towards the achievement of 40 000 new connections.
Procure an Electric specific domain software and data model to update and maintain the electrical and communications networks in the GIS.
Model all HV sites to support incremental updates to the HV SCADA system.
Finalise the GIS Roadmap for the Unit.
Cleansing data to do spatial analysis on customer location for various Branches.

Achievements and awards

Some staff obtained their Exploring Geographic Information Systems qualification from UNISA
One Survey Attendant achieved 100% pass in the first semester of his IT Diploma at PC College.
The Chief Survey Technician obtained his Post Graduate Diploma in Project Management from MANCOSA.

The Administration Division provides an administrative service to the six internal Divisions and a GIS service to assist other Branches in some business processes.
PROTECTION AND TEST BRANCH

The Protection and Test Branch comprises four technical Divisions, namely Protection Engineering, Test, Protection Maintenance and DC Systems. These Divisions are collectively responsible for the forward planning, analysis, design, updating, testing, commissioning, auditing, maintenance and repair of all protection and DC systems in the electrical network. The Branch is also responsible for the investigation of all protection or DC related mal-operations. In addition, the branch provides other crucial services like cable fault location as well as various equipment testing, commissioning and repair services to the entire Electricity Unit.

Routine activities
- The calculation and application of optimised protection settings to ensure proper discrimination and effective fault clearance times in the MV and HV electrical network.
- The updating, maintenance and control of protection drawings and relevant databases to ensure accurate records and statistics.
- The investigation of protection and DC mal-operations.
- The planning, maintenance and repair of all protection and DC equipment according to stipulated maintenance guidelines.
- The testing and commissioning of substation installations, protection systems, DC systems and equipment to ensure that new substations are brought online timeously and that any protection upgrades are brought back into service within set target dates.

Highlights / Lowlights
- Thirteen battery banks and 5 battery chargers were replaced at Transmission substations and at Distribution substations. 11 battery banks and chargers were replaced during the year as part of the Branch's upgrade programme to replace aged and failure prone DC equipment.
- The DC systems at 36 transmission stations were audited during the year to ensure that all the DC loads were correctly wired and labelled to facilitate troubleshooting and the safe isolation of control equipment.
- The protection settings at 15 Transmission substations was also audited by the branch to ensure that the settings and relay configuration at the substations is optimised to provide proper discrimination as well as fast and accurate fault determination and fault clearance.
- Fault locations for a total of 1702 HV/MV cable faults, 1637 LV cable faults and 1750 House service cable faults were provided by internal staff during the year.
- The addition of a cable fault location contract assisted the branch with both improving service delivery and reducing the overtime worked by the branch's fault location staff.
- The replacement of GE relay modules to prevent further failure of these devices claimed a significant amount of branch resources resulting in backlogs in some maintenance areas.

CHALLENGES
- Addressing the relay failures that have occurred and identifying solutions with the relevant manufacturers to ensure that these modes of failure are eliminated.
- Addressing the maintenance backlogs that were created by staff shortages and the GE module replacement programme.

TECHNOLOGY SERVICES BRANCH

The Technology Services Branch consists of three different divisions, namely the engineering division, quality and investigation division and the Library division. These divisions collectively ensure that the electrical products procured are fit for purpose by compiling the correct technical specifications, ensuring quality control at stores and investigating failed equipment.

One of the functions of the branch is research into cost effective ways of distributing electricity. This function can be divided into two, namely, the cost of goods purchased and the costs associated with the installation, operation, maintenance and disposal of the said goods. Over and above the issues relating to construction and maintenance, safety of staff and public is high on the agenda both during the selection of a particular type of good and during its application. Technology Services has as its primary goals the adjudication of all tenders for technical equipment, material and services supplied to the Service Unit, and the creation and maintenance of all technical codes of practice and instructions used by eThekwini Electricity staff and contractors.

The Branch has continued its active participation in NRS Workgroups and SANS Workgroups in conjunction with other municipalities, Eskom, mines and major suppliers, specifications and guidelines. This participation has been to promote uniform requirements for equipment and design methods for use in distribution systems.
SHERQ & TRAINING BRANCH

New and exciting projects undertaken

Challenges

New and exciting projects undertaken

As part of the branch's objective, the division is busy in running career fairs and skills development programs to encourage personal growth and development of the staff to improve the efficiency and effectiveness of the division. The branch is also involved in various skills development programs. Engineering technologies that are introduced as they form an integral part of the business of Electricity Unit. The branch fulfils a critical role in training and development of technical personnel. Construction is expected to be completed in 2017. The technical specification and a bid award for the procurement of medium voltage (MV) cable accessories have been done. Assistance is required to offer training of cable jointing and cable terminating using eThekwini Electricity's cables, with NRS 053/SANS 1332, SANS 10198 and relevant SAQA or ESETA requirements. Bidders are required to offer training of cable jointing and terminating kits made provision for the sourcing of training for the staff and contractors who are responsible to install these cable accessories. The training requirement is in accordance with practical training. The objective of this training is to reduce or eradicate failures caused by poor workmanship.

The completion of the Overhead Mains Code of Practice (OHM CoP). This CoP was the last in the three part series (the others are the Substation and Underground Mains CoPs) originally planned for revision.

The branch is also involved in various skills development programs. Technology Services investigated the use of alternative materials. Resin concrete proved to be suitable for the application. It is lightweight (lighter than steel chequer plate) and meets the required specifications in terms of durability and strength. The key advantage of this material is that it has no scrap value, which will greatly assist in reducing theft from substations. A contract is in place to provide 120 resin concrete covers. The covers are made to order by going through the standardisation and this forum provides a central repository for all documents.

Routine activities

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The Customer and Retail Services Department provides a customer contact and retail services function for the Electricity Unit. The Department consists of more than 5 branches that collectively perform a diverse range of important functions.

Manager:
- Contact Centre

Senior Manager:
- Pricing and Marketing
- Meter Engineering
- Revenue Protection

DEPUTY HEAD
CUSTOMER AND RETAIL SERVICES

Provides a customer contact and retail services function for the Unit.
The Electricity Pricing and Marketing Branch has several primary functions namely:

- To raise awareness about key issues involving electricity
- To provide a technical and administration service to our key customers
- To design cost-effective and accurate electricity tariffs
- To maintain a statistical database for electricity purchases and sales and other important information

Energy conservation and management have become key concerns in the industry due to the repercussions of the recent energy crisis.

**MARKETING DIVISION**

The Marketing division is continuously holding interactive events to raise awareness and promote the core activities of the department. Demand side management through behavioural changes and efficient technology adoption are being promoted by the marketing team, and this is being carried out at the primary and secondary school-levels.

The activities of the Marketing Division create a platform to engage with the public to address the following:

- Energy-efficiency and demand-side management (DSM)
- Service delivery problems and constraints
- Theft of electricity and infrastructure
- Free Basic Electricity
- Electrical safety and electricity hazards

**Future Plans**

The Marketing Division has also been working closely with communities and the internal planning staff in order to assess the feasibility of electrifying areas that are without electricity. There are numerous challenges to overcome before all citizens are electrified, however the Branch is committed to make this a reality in the coming years.

With the looming introduction of smart grid technologies, the Branch has proactively commenced formulating a marketing plan to introduce the concept to the targeted customer base. Numerous communication avenues are being investigated to ensure that the strategy is ultimately effective and successful. It is envisaged that the smart grid marketing plan will be rolled out in conjunction with the technology roll out in 2017.

**PRICING DIVISION**

The Division designs electricity tariffs and provides tariff advice to Bulk users. Tariffs are designed to be cost-effective whilst ensuring accurate cost recovery and reflectivity. Bulk electricity costs were subject to a 14.24% increase for the year.

As a result of this major increase and other internal cost escalations, the National Energy Regulator of South Africa (NERSA) approved a 12.20% increase for the customers of eThekwini. Customers consuming electricity on the Scale 12, Free Basic Electricity tariff structure were subject to a reduced tariff increase of 9.6%.

Electricity prices continue to experience higher than average increases, as we continue with the national electricity build program of introducing more generation capacity to the grid. As electricity prices soar, there is greater tendency to migrate to alternate and cheaper forms of electricity provision. Rooftop PV generation is becoming a popular site within the city and greater pressure is being placed on municipalities to allow for the buyback of generated electricity.

While the National framework for embedded generation is still being developed, eThekwini intends to pilot an embedded generation scheme to allow for the off-set of electricity generated by residential customers. Stringent technical and safety criteria will be enforced to ensure the safety of network operators and grid stability.

While embedded generation is still in the emerging phases, it brings to the fore the reality that the distribution grid will have to compete with local generation facilities in providing electricity to customers. In view of this, we need to ensure that we further enhance the efficiency of our operations going forward and implement tariff structures that promote cost reflectivity and transparency.

Electricity sales for the year has risen by 1.32%. This is a welcomed increase when compared to the year before. The demand for electricity has continued to grow as a result of economic growth and industrialization.

The c/kWh charge per category is detailed below:

<table>
<thead>
<tr>
<th>Category</th>
<th>Tariff Rate per kWh (c/kWh)</th>
<th>Service Charge (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scale 3,4,8,9</td>
<td>129.39</td>
<td>NIL</td>
</tr>
<tr>
<td>Scale 12</td>
<td>90.51</td>
<td>NIL</td>
</tr>
<tr>
<td>Business &amp; General Scale 1</td>
<td>146.12</td>
<td>191.20</td>
</tr>
<tr>
<td>Business &amp; General (Obsolete) Scale 2</td>
<td>62.61</td>
<td>195.81</td>
</tr>
<tr>
<td>Business &amp; General Scale 10 &amp; 11</td>
<td>162.24</td>
<td>NIL</td>
</tr>
<tr>
<td>Business &amp; General (Obsolete) Scale 5,6,7</td>
<td>152.47</td>
<td>195.81</td>
</tr>
</tbody>
</table>

Industrial / Commercial

The average c/kWh will vary depending on the consumption profile of the customer.
**Future Focus**

We are continuing with our efforts in rationalising our tariffs to become more transparent and cost reflective, to ensure that the correct pricing signals are passed onto customers. Non cost reflective tariffs are discouraged by the introduction of higher than average tariff increases.

We intend to pilot a residential embedded generation tariff structure to allow customers to generate electricity onto the grid. The tariff will allow customers to partially off-set generated electricity against consumed electricity. It is envisaged that this program will be implemented in 2017.

**CONTACT CENTRE BRANCH**

The Contact Centre provides a one-stop faults reporting service, we assist in capturing of meter readings, load shedding queries, theft reporting, the use of prepaid meters, vouchers and all other administration enquiries for the benefit of eThekwini Electricity’s service delivery.

We aim to deliver excellent service through multi-media communication, such as Voice, Email, Website, SMS and via Social Media. We are available 24/7/365 and we communicate with our consumers through a number of channels. Voice: 0801313111 (toll free), SMS: 0837000819, email: custocare@elec.durban.gov.za and website: www.durban.gov.za.

**Highlights**

- We employed multitasking call centre agents that assist our customers via voice calls, SMS and email. Our footprint of email/SMS and other media has grown dramatically in the past year, evidence that introducing these communication platforms and employing special agents to handle them was indeed an excellent idea. This has done so well that we did well over 150 000 thousand conversations via SMS and Email alone from July 2015 to June 2016.
- 90% Contact Centre interactions are now being routed via Genesys, a high tech telephony system, this has given us better communication with consumers, effective and efficient call handling and having real life and historical data for tracking and reporting.
- We introduced a Quality Assessment and Coaching function. This has been a huge success as we have been able to identify and bridge training gaps. In the last financial year a total of 82 employees were trained on Improving Service Delivery, taken to a technical field exposure to skill them in assisting consumers with minor technical queries. Supervisors, Management and support teams were also trained on courses such as Managing Poor Performance and Incapacity, Interview Skills, Initiating Disciplinary Enquiries etc.
- Lastly the launching of a Netball Team has been another highlight for the year.

**Low lights**

- Onsite work stoppages due to protests and external interference has lowered our service level standards but they are still in very high levels, and the abandoned rate still remained lower than the past two years.

**New and exciting technologies**

- No New technologies for this financial year however phase three of the Genesys systems procured in 2015 was implemented. Now 90% Contact Centre interactions are now being routed via this system, a high tech telephony system, this has given us better communication with consumers, effective and efficient call handling and having real life and historical data for tracking and reporting.

**Challenges**

- We do not foresee any major challenges in the next financial year. We have seen a more positive relationship between Contact Centre, Consumers and our other internal departments such as Depot and Control promising to get even better in the next year.

**Achievements and awards**

- No awards were received in the last financial year. We have however achieved very high quality standards, this shows by having received over 50 formal compliments from consumers on having met and exceeded their service expectations. Our sick leave has been the lowest in a very long time, hitting below the SAR standards.
- We introduced a rewards and recognition process for the Contact Centre, 35 certificates have been issued to several employees for being top achievers of each team, each month from Feb-Jun 2016, criteria include but not limited to; Best Attendance, Best Call Quality etc.

**METER ENGINEERING BRANCH**

The Meter Engineering branch is responsible for metering bulk customers which accounts for about 40% of revenue. In addition to maintaining the metering of these large power users, the Meter Engineering branch is also responsible for clustered metering schemes and the metering installations for business customers. The branch is further responsible for the acquisition of meters and metering systems equipment to cope with the demands of new technology and revenue protection challenges. All meter upgrades and new installations in the industrial and commercial sectors are undertaken by the branch.

The Meter Engineering Workshops is responsible for the repairs, testing and calibration of conventional and prepayment meters. Batch sample testing is done for new meters that are purchased.
Phase Task Name Status Project Plan Date

1 MVMS Suprima Complete Nov 2015 Jan 2016
(System tested, (delayed due to legal requirements)

2 MVMS HES Complete Jan 2016 Feb 2016
Delayed due to Phase 1 Pushed out

3 MDMS Complete Mar 2016 Mar 2016
(System and Hardware)

4 MDMS integration Ongoing (planned Mar 2016 ______ for the next two years)

5 ICG testing & billing RMS interface / bulk Planned May Delayed due to import tests between RMS go Live.
(RMS and MDMS Bulk (ICG) meter (APN communication import file testing ongoing) completed

6 Smart meter pre Audit and site Started Nov 2015 Smart meter installation audits investigations. installation will (meter enclosure only start once tenders issued after this city billing audit findings systems are stabilized (RMS & COINS) -----

7 Data concentrator Audits started in Ongoing Ongoing 25

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The Aim and Strategy
The aim and strategy of the Meter Engineering branch is to provide an efficient metering service to our internal and external consumers by implementing new technologies and ensuring that there is compliance with recognized metering standards. The aim will be to develop a strategic framework for enhancing the effective management of all metering related processes. The projects undertaken are as follows:

1. **Upgrade of the Metering Workshop**
   - Our goal is to upgrade the metering workshop equipment that has now become outdated and is no longer able to perform its function of ensuring compliance with recognized metering standards.
   - Work is expected to commence in the fourth quarter of 2016, with the new equipment being operational by the first quarter of 2017.

2. **Phasing out of Electro-mechanical meters for Two-Rate Tariffs**
   - Our goal is to complete the changeover of all electromechanical meters that are on the two-rate tariff that are CT and direct driven to electronic programmable meters. Our aim will be to complete changeovers for 75% of the remaining meters that are electromechanical.

3. **Smart Metering Roll-Out project**
   - The implementation of AMI has already started. The original objective was to install all systems before the 31st of March 2016, but due to delays, the timeline has been extended.
   - The current status is that all systems are installed and ready for commissioning.

4. **Other Deliverables**
   - Priority to be given to quality, throughput and the finalising of documentation of procedures and business models.
   - Continue working with stakeholders and reviewing all work processes.
   - Our focus will be on creating and reinforcing effective policies and procedures to provide an improved service level.
   - We will finalise the documentation and formalisation of all the installation and commissioning procedures that have been implemented in recent years.

5. **Audit of Top Ten Customers**
   - We will commence with a full-scale audit of the top ten customers to verify that they are being correctly billed. This exercise will provide skills transfer to our junior technical staff and equip them with the necessary skills to conduct similar audits.
   - The overall goal is to complete the auditing of at least the top 10 bulk metering installations that the branch is responsible for.

6. **Other Deliverables**
   - Continue working with the RMS development team for billing of consumers.
   - We will develop a closer working relationship with stakeholders and review all work processes.
   - We will develop a closer working relationship with stakeholders and review all work processes.
   - We will develop a closer working relationship with stakeholders and review all work processes.

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SMART METERING ROLL-OFF PROTOCOL

- The aim of the protocol is to ensure that the metering equipment is able to perform its function of ensuring compliance with recognized metering standards.
- The protocol is designed to provide a framework for ensuring the effective management of all metering related processes.
- The protocol also provides a framework for ensuring the effective management of all metering related processes.
CUSTOMER SERVICES BRANCH

This branch is responsible for the processing of all applications for supply, registration of customers for billing purposes, meter reading services, auditing of meter readings, resolving account queries/disputes, technical advisory service and the cashiering facilities at various electricity customer services centres.

Highlights / Low lights

RMS (Revenue Management System)

The "RMS System" has gone live and Customer Services administration staff are still assisting when required to ensure that Electricity's concerns are addressed. There have been delays in the launch of the RMS project and staff are working extra hours to cover up the lost time.

New Applications

The ongoing provision of "RDP" Housing as well as the electrification of Informal Settlements has seen our administration staff efficiently processing applications to ensure the timeous "switch on" of electricity for these houses. This is only possible with the close co-operation between the Housing Department, Customer Services, Finance Department and the Depots and will be ongoing in this new financial year with new improved methods of communicating with Housing.

Meter Reading

We investigated the market for new meter reading hand-held units due to the current high costs of maintenance and replacement of the present units. A cheaper local manufacturer was sourced. These are currently being utilized by the Electricity and Water Departments. We are now sourcing new software for the meter reading system due to the old system becoming redundant.

Improving Security

In view of the high crime rate, Customer Services Centres are always improving security for both their staff and customers. New cameras are being rolled out to all centres.

Accommodation

A new Customer Service Centre was opened at 15 Twilight Avenue, Umhlanga. The Customer Service Department has identified the above property suitable for the relocation of the Northern Customer Service Section to the North of Durban for the convenience of customers due to the expansion of the region. Presently we service approx. +/- 50 000 residential customers and 8 000 businesses in this area.

All customers from the Umgeni River area p to and including the Westwood/organ areas are now accommodated in 15 Twilight Avenue. The Customer Service Department has identified the above property suitable for the relocation of the Northern Customer Service Section to the North of Durban for the convenience of customers due to the expansion of the region. Presently we service approx. +/- 50 000 residential customers and 8 000 businesses in this area.

New Technologies

SMS technology

This has been introduced to capture meter readings by consumers via cellphones. These readings are then captured on the system by staff at the Contact Centre.

Web Page Design

This is being investigated to capture on-line applications, account queries, meter reading capture, token purchases and compliance information to be displayed. The project is being led by the Revenue Treasury Department.

Rotunda Displays

These large screens will be placed at entrance of Rotunda displaying all necessary information to consumers regarding applications, queries and tariffs. Once this system is optimized, it will be installed in all Customer Service Centres.

REVENUE PROTECTION BRANCH

Revenue Protection Strategy is a systematic ongoing process and not a once-off operation. Utilities need to proactively identify and target consumers that actively contribute to revenue losses and take necessary action to minimize these losses. The pillars of successful revenue protection are People, Processes and Technology, need to be integrated into a Revenue Protection Strategy. The following projects or technologies are implemented by eThekwini Municipality to enhance Revenue Protection.

Meter Management and Operation System

- Implementation of AMI
- Registration of Customers
- Revenue Management (Debt and credit management)

Installation of Prepayment Meters and the principle of debt collection via a prepaid meter i.e. 80/20 & 50/50 policy.

Protective Structures

Audit of Business Customers.

Over the years eThekwini have embarked on projects that contributed to the success of eThekwini Electricity maintaining total losses to below 6 percent. Recently we are experiencing a challenge in accurately recording or calculating our losses, and as a result, for this financial year they were inflated to 10.7%.

Proposed action for the Control of Revenue losses is the implementation of the Revenue Management System (RMS) and the introduction of Prepayment Meters. The following are some of the key objectives of the RMS System:

- Identification and targeting of revenue loss contributors
- Implementation of automatic debt collection
- Reduction of administrative costs
- Improved customer service
- Increased revenue collection efficiency
- Reduced revenue losses

The RMS System is designed to improve revenue collection by identifying high-risk customers and implementing appropriate debt recovery measures. It also provides real-time insights into revenue performance, enabling proactive management of revenue risks.
The normalization team’s skill set is selected towards the remedial tasks to be performed. The normalization team has no direct contact with the audit team.

Fraud is limited since there is no impute to bribe the audit team not to report anomalies. The audit team could focus on the data acquisition and their productivity is optimized.

With more than 350,000 pre-payment meters under our management, field operations and data management could quickly become a daunting task. A high level of data validation and seamless system integration would be required. Previous audits have met with limited success because of these challenges. The field operations consisted of two separate, but integrated actions. The first action was the physical meter audits. The primary aim of the audit was to update the meter records of sales.

The second action was to address all required remedial field work identified by the initial audit. These operations included:

- Technology - This is the last element, but it is only effective once the first two pillars are in place.
- Processes - The correct processes and procedures established at the start of the project are essential.
- People - A project can only be effective with committed and dedicated resources.

In planning the audit, the success of the operation was based on three main factors:

- Data Reporting and Data mining to plan and execute a pro-active Revenue Protection program.
- One Central Master System that reconciled all records.
- Leveraging smart meters as an integral part of the game.

The following was required to address this challenge:

- The use of meters is widely accepted for increasing energy efficiency and sustainable development.
- Smart meters have many functions of many current issues of energy efficiency and sustainability.
- Smart meter is an energy metering device with enhanced capacity to store and analyse information from smart meters. It can transmit data (and transferred by AMI communication systems) and other investments in the digital grid.

A structured field audit with the aim of normalizing all pre-payment and as well as residential credit meter records were revised. This had the undue effect of placing greater number of readings in audit.

The audit team can now in the position to run an intelligent revenue protection program based on back office analysis. We embarked on a program to normalize our pre-payment data set and in parallel launched a paperless work order system to follow up on all remedial tasks identified through this project.

The use of smart meters is widely accepted for increasing energy efficiency and sustainable development. The following was required to address this challenge:

- Data Reporting and Data mining to plan and execute a pro-active Revenue Protection program.
- One Central Master System that reconciled all records.
- Leveraging smart meters as an integral part of the game.
Operational Savings: Smart meters will result in operational savings such as reduced truck rolls, automated meter reading, and reduced energy theft.

New Customer Services: Smart meters will enable new services such as automated budget assistance and bill management tools; energy use notifications; and smart pricing and demand response programs.

Smart Prepayment Module - Phase 1 (Suprima)

This phase was the implementation of the smart prepayment vending module. This was intended to be implemented as the last phase. However, based on business needs since the existing vending contract was expiring, then this was pushed to the top. This benefited the municipality in the following ways:

- The vending system is fully owned by the municipality as opposed to the previous one which was hosted.
- The management of the system is overseen by eThekwini Staff wholly.
- Legacy systems from the previous system were eliminated, thus making the management of third party vendors easy. With the new system only one super vendor is managed by the municipality.
- System reporting is another major benefit to the municipality. Relative stakeholders can access and generate reports as per their assigned roles in the organization.
- Business processes for managing prepayment and its associated roles improved because reliance on legacy systems was eliminated.

Then central feature of Suprima is its ability to vend electricity to meters that are registered on the system. The meter needs to be registered so that the system has the details it needs to encrypt the credit transfer number (CTN) correctly.

There are 2 sets of information that are important: the meter encryption details, such as the Supply Group Code (SGC), Tariff Index (TI) and Key Revision Number (KRN) that the meter is on. If these are incorrect then the meter will not be able to decrypt the content of the CTN and it will be useless.

The second set of information is the tariff, taxes, and fixed charges information associated with the meter.

Registration of Customers

EThekwini Electricity embarked on a Customer Data Cleaning exercise that ensures that all prepayment customers are registered and this exercise was very critical in successfully implementing the Suprima prepayment vending system.

Before being able to vend to a meter there are a number of items that need to be registered on the system. This is so that Suprima can correctly determine the meter's configuration so that the correct encryption parameters can be applied and so that it can calculate the charges that are to be applied, other amounts that need to be recovered, etc.

The registration is also needed to be able to manage your meter effectively. If you do not provide the correct information when the meters are being installed, then this will be impossible to correct at a later stage. It is critical that you provide the correct information at the beginning.

The picture above depicts that EThekwini Electricity allows the Suprima system to vend to a meter. The central point of the setup is the Location, also known as a POC (Point of Connection) or Point of Supply. But in all cases, this is the fixed point where the electricity supply enters a house or building and it is usually determined by the physical address where it is located.

All eThekwini Electricity can change, a meter can go faulty and be replaced, customers can move in and out and even the vending categories can change as when a consumer opens a home business and the category changes from domestic to business supply.

Arrears balances are associated with the consumer, because it is the consumer that owes money.

If a consumer is linked to more than one Location any arrears owed by the consumer will be deducted when vending to any of the locations. Also, if a consumer moves out of one location and into another then the arrears will follow the customer to the new location.

Revenue Management (Debt and credit management)

This is based on the Smart Prepayment Vending System as it has been fully deployed since January 2016. The following are the benefits thus far;

- The system is fully owned by the Municipality as opposed to the previous system that was hosted by its supplier. The unit is set to break even in October 2016, this is based on comparing the monthly hosting fee that was paid by the municipality versus the capital cost of the system.

Before you can do anything else, you need to add the meter to your meter library. This is the first step in finding the meter that you are vending to.

The next step is to find the meter that you are vending to. This is usually done by searching the system or by selecting a meter from the meter library.

Once the meter has been selected, you can then proceed to vend to the meter. This is done by entering the CTN and the amount to be deducted from the meter's balance.
Throughout the world as a method of communication for home automation systems.

In some areas, there is a need to modernize the metering system to ensure the secure and efficient transmission of information. This is especially important in areas with high levels of theft of electricity and illegal connections. The use of smart meters that communicate using advanced Power Line Carrier technology is widely recommended.

The choice of a dedicated communications channel is critical in ensuring secure and efficient data exchange. This approach eliminates the need for retrofitting house service mains with communications cables, reducing costs and complexity.

Customer Interface Units (CIU) are achieved via existing mains cables. The split prepayment meter that uses power line carrier (PLC) technology is the electricity prepayment system that totally eliminates the need to install a dedicated communications cable. Instead, communication between the externally fitted Remote Energy Dispenser (RED) and internally installed system that provides the necessary functionality.

Benefits:
- Can budget for the cost of electricity
- Prevents meter from being turned off due to non-payment
- Minimal chance of meter running out, as you will be notified before it does
- Ability to purchase electricity for as little as R5
- No shocking bills at the end of the month
- You pay only for what you use
- No penalties, fees, and interest charges
- No arrears

Advantages for a prepayment metering system:
- Can budget for the cost of usage
- No meter running out
- Minimal chance of arrears
- Ability to purchase electricity for as little as R5
- No shocking bills at the end of the month
- You pay only for what you use
- No penalties, fees, and interest charges
- No arrears

The installation of prepayment meters and the principle of debt collection via a prepaid meter are widely recognized as effective strategies that are complementing each other to ensure sustainability. We strategically targeted poor customers who are struggling to pay for their services to install prepayment meters due to the following:

- Many poor customers who are struggling to pay for their services
- Many who pay very little for water or don’t pay at all due to their 6klr free allowance
- The majority of them are exempt from payment of services and their water consumption is low, as a result, they pay very little for water or don’t pay at all.
- Many poor customers who are struggling to pay for their services

The installation of a prepayment metering system and the principle of debt collection via a prepaid meter played a crucial role in affording the poorest of the poor access to basic services, in the process partly alleviating the problem of non-payment of services. It is critical that one devise strategies that are complementing each other to ensure sustainability.

Utilizing one super vendor has enabled the municipality to improve on the collection of electricity. Previously, the municipality dealt with 120 dispensing legacy systems. With the introduction of the system, the municipality now deals with one super vendor for selling electricity to the customers.

Revenue Protection Division conduct annual audits to verify measurement and metering equipment needs to be adopted to ensure that utilities comply with NRS 057 and the Electricity Metering Code of Practice.

It is imperative that utilities provide the necessary training to the Revenue Protection and Meter Audit of Business Customers (CT Driven Installations)

Benefits:
- Detailed understanding of metering and measurement equipment
- Ensures a high-quality metering and measurement system
- Ensures accurate metering and measurement
- Enables precise and accurate metering and measurement

The split prepayment meter that uses Power Line Carrier (PLC) Technology is ideally suited to the retrofitting or replacement of conventional meters. We decided to install split prepayment meters that use Power Line Carrier (PLC) technology in some areas.

The ability to use standard household wiring makes this an extremely attractive and cost-effective technology ideally suited to the retrofitting or replacement of conventional meters. We decided to install split prepayment meters that use Power Line Carrier (PLC) technology in some areas.

Audit of Business Customers (CT Driven Installations)
The Human Resource Department is responsible for providing guidance and support to employees of the eThekwini Electricity Unit. HR Staff are involved in addressing issues which impact Human Resource management for the Unit as a whole, through coordination of policy and support to the employees of the eThekwini Electricity Unit. HR Staff provides guidance and human resource support to employees.
This branch provides an integrated Human Resources Services to the staff of the Electricity Department in the field of Employee Relations, Talent Management, Pay Administration and Recruitment Administration.

**Highlights**

- The launch of the LinkedIn project provided staff as well as prospective employees the platform to access vacancies using professional networking media.
- The Human Resources staff moved office from the Network Control building to the ground floor of the HQ building which made accessibility to staff more efficient.
- The business strategy to retain scarce skills was revived with the Talent Management Project.
- The move of the Finance department from the Electricity Unit to the Expenditure Unit was a challenge during the financial year and was concluded in the new year with outstanding grievances that are in progress.

**Challenges**

- The finalisation of all outstanding appeals was concluded and the retrospective pay of grade improvements remains a challenge for the new year.
- The filling of 1119 vacant funded posts have posed a challenge in terms of attracting the appropriate demographic group. The 185 posts that were advertised were aimed at female appointments to address targets in the Employment Equity Plan and the majority of applications received were from male applicants.
- The uncertainty regarding the institutional review has caused delays with departmental planning.
- The Human Resources staff have identified a delay in receiving applications to address the challenges.

**Future Focus**

- The completion of performance reviews on e-Performance was 50% achieved in the current financial year and the target for the new year is 100%.
- The time attendance module of the HR System is fully implemented successfully for all levels.
- The Human Resources staff moved their office to the new building on the ground floor of the former Hydro Building to access more efficient and productive working space.

**Posts Filled**

- Electricity Post Analysis as at June 2016
  - Posts Filled: 367
  - Posts Advertised: 185
  - Unfunded Vacant Posts as at June 2016: 214
  - Funded Vacant Posts as at June 2016: 1119

**Figures**

- In the last financial year, the appeal processes for recruitment and promotion were finalized.
- The Human Resources staff have identified a delay in receiving applications to address the challenges.
- The uncertainty regarding the institutional review has caused delays with departmental planning.
- The Human Resources staff have identified a delay in receiving applications to address the challenges.
- The Human Resources staff have identified a delay in receiving applications to address the challenges.
The Commercial Departments of Finance, Information Communication Technology, Productivity and Business Process Engineering, Supply Chain Management, Business Risk, Administration and Transport play a vital support role to eThekwini Electricity. They also participate in numerous other Council projects/committees. Within the staffing constraints currently experienced they strive to provide effective logistical support to the technical operations. A key feature of these departments is to ensure that all legislative, legislative practices, controls, policies and procedures are complied with.

In addition to the onerous Local Government Legislative and governance controls we also have to comply with the National Electricity Regulator requirements for reporting as a ring-fenced Business Unit.

The Commercial Departments of: Finance, Information Communication Technology, Productivity and Business Process Engineering, Supply Chain Management, Business Risk, Administration and Transport are headed by:

- **Senior Manager**: Finance
- **Senior Manager**: Productivity
- **Senior Manager**: Business Risk Control
- **Manager**: Information and Communication
- **Manager**: Administration and Transport
- **Manager**: Supply Chain Management
- **Manager**: Administration and Transport

Ensures that legislative practices, controls, policies and procedures are adhered to.
ADMINISTRATION AND TRANSPORT BRANCH

The Administration Branch covers three key support areas, viz, Administration, Buildings / Security and Fleet. The Administration Section is responsible for providing an efficient and effective Document Management System, and operates within the parameters of an approved Governmental Archival System. The Sections undertakes various other Administrative Functions, i.e. the internal mail delivery service, management of the Telephone Management System, control of stationary stores, travel arrangement, Word Processing of letters, reports, contract documents and transcribing of meetings, disciplines/enquiries etc. and Security / Cleaning service management.

Challenges & Mitigations

A major challenge is the lack of suitable office accommodation and parking space, from the ever-increasing number of Staff being employed and the decision to reduce the number of lease premises. Additional office space is being built at our existing Training Centre and new Customer Centre, at 34 Kings Road, Pinetown. Planned building extension will be undertaken at our H.Q. and Springfield Complexes, in the near future.

The Fleet Section is responsible for the acquisitions, maintenance, and disposal of vehicles. The current fleet size is 1,359, consisting of various type of specialist trucks, cranes, bakkies, cars, trailers, compressors and generators. The majority of the fleet, are specially modified to suit the work activities undertaken by operational staff, in the field.

- Challenges are the increase in the number of vehicle damages and accidents. Driver re-training, is proving successfully and the electronic monitoring / action taken against deviant driver behaviour has reduced the number of public complaints against our drivers. - The availability of replacement vehicles, when operational vehicles are scheduled for service and/or repairs, has proved to be a major challenge. - Standardisation of vehicle modifications has mitigate this challenge to some degree, however other interventions will be explored.

INFORMATION AND COMMUNICATION TECHNOLOGY BRANCH

The 2014/2015 financial year has proved to be a challenging year for the I.C.T department. 2016 has proved to be another challenging year for the I.C.T department, dominated by the implementation of JDE for Finance, Materials Management and SCM. ICT resources have been stretched to the limit in ensuring that this major business initiative was a success. Notwithstanding numerous challenges, the implementation in July 2016 was relatively successful with data migration, system integration, process re-engineering and end user training, being significant undertakings due to the sheer scale and compacted project timeline. There are however still a number of minor issues that require resolution and the IMU unit together with the JDE Consultants are addressing these. Again, significant effort has been expended on recruitment, however human resource capacity and the slow pace of recruitment remains a concern affecting all divisions in ICT, exacerbated by a number of resignation in key posts.

FINANCE BRANCH

The Finance Branch is responsible for the financial control over all activities of the Department. This includes, inter alia, the management, monitoring and control of revenue, expenditure, capital expenditure, insurance claims, financial systems, procedures and the provision of advice and guidance on matters related to finance to all personnel. The Department's annual and medium term budgets, annual financial statements and monthly management reports are prepared by the Finance Branch. The Finance Branch is responsible for the financial control over all divisions of the Department.
The Bid Administration Section administers 200 contracts for the supply of goods and services of which 53 are labour contracts. Four appeals were received by the Appeals Committee and were successfully defended.

The following table is reflective of the actual awards to Black Business Enterprises for all public tenders.

<table>
<thead>
<tr>
<th>PBE</th>
<th>BBE WBE DPBE LOCAL Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>R 1000000 000.00</td>
<td>R 2000000 000.00</td>
</tr>
<tr>
<td>R 4597970 557.30</td>
<td>R 6778715 607.74</td>
</tr>
</tbody>
</table>

**Annual Spend on Target Groups**

**2015/2016 Financial Year**

- **Tenders & Contracts Register**
  - No. of award Value % of Total
  - Tenders awarded to PBE's PBE 2025 R 2 508 339 805.28 30.3%
  - Tenders awarded to BBE's BBE 2474 R 4 597 970 557.30 55.6%
  - Tenders awarded to WBE's WBE 1457 R 1 818 714 762.15 22.0%
  - Tenders awarded to DPBE's DPBE 1 R 8 271 880.08 0.1%
  - Tenders awarded to Local Companies LOCAL 2687 R 6 778 715 607.74 82.0%
  - Total Tenders awarded Total 2926 R 8 271 539 594.87

- **Premium Paid** R 0.00

**MAY - 16**

**BEE Score Levels No. of award Value % of Total**

- > 100 B-BBEE Level 1 672 R 1 718 600 589.68 20.8%
- 85 ~ 100 B-BBEE Level 2 252 R 2 101 323 996.50 25.4%
- 75 ~ 85 B-BBEE Level 3 875 R 1 703 797 465.50 20.6%
- 65 ~ 75 B-BBEE Level 4 84 R 576 373 980.47 7.0%
- 55 ~ 65 B-BBEE Level 5 21 R 283 116 678.63 3.4%
- 45 ~ 55 B-BBEE Level 6 10 R 49 876 720.40 0.5%
- 40 ~ 45 B-BBEE Level 7 5 R 16 265 957.91 0.2%
- 30 ~ 40 B-BBEE Level 8 7 R 72 563 845.26 0.9%
- < 30 Non-Compliant 1000 R 1 758 620 360.52 21.3%

**Totals** 2926 R 8 271 539 594.87

**Annual Spend on BBBEE Contributions**

**2015/2016 Financial Year**

- **Tenders awarded to PBE's** PBE 2025 R 2 508 339 805.28 30.3%
- **Tenders awarded to BBE's** BBE 2474 R 4 597 970 557.30 55.6%
- **Tenders awarded to WBE's** WBE 1457 R 1 818 714 762.15 22.0%
- **Tenders awarded to DPBE's** DPBE 1 R 8 271 880.08 0.1%
- **Tenders awarded to Local Companies** LOCAL 2687 R 6 778 715 607.74 82.0%

**Premium Paid** R 0.00

- **Total Tenders awarded** Total 2926 R 8 271 539 594.87

**B-BBEE Level**

- **Level 1**
- **Level 2**
- **Level 3**
- **Level 4**
- **Level 5**
- **Level 6**
- **Level 7**
- **Level 8**

**Source:** EThekwini Metropolitan Municipality
STORES DIVISION

Stores is a Division within the Finance & Administration Department of Electricity Service Unit, that forms part of the Materials/Buying division.

We operate 17 Stores located throughout the distribution area and stock 3,500 items. In addition to the warehousing and issuing of stock items, the Stores are responsible for receiving of all direct (outside) purchases.

PRODUCTIVITY BRANCH

The Productivity Branch contributes to the upgrading of productivity and efficiency throughout the Unit by closely monitoring the productivity of both in-house and contractors teams, and ensuring that the undertaking remains cost effective whilst maintaining a high level service standard to management.

With the ever increasing number of contractors working for the Unit, monitoring and verification of worked claimed is essential in ensuring that a high standard of efficiency and productivity is maintained and that any fraudulent booking of work is brought to the immediate notice of management.

We are currently in the process of developing an in-house computer programme to assist with the calculation of productivity. This should be completed within the year and will greatly assist the Division in accurately assessing the work claimed.

There are two vacant posts, a Senior Clerk and one Productivity Officer, both posts have been advertised.

BUSINESS RISK CONTROL BRANCH

The Business Risk Control Branch comprises of the Risk Management Division and the Infrastructure Theft Investigation Division.

The Risk and Compliance Management Division is responsible for the formal identification, evaluation and mitigation of risks within eThekwini Electricity. Compliance to policies and procedures is assessed for the different Departments to assist to improve controls by generating appropriate solutions to resolve problems/ issues.

Risk workshops were conducted during the year with all the Departments, where the Unit's strategic and operational risks were identified and assessed. Together with the relevant stakeholders, risk mitigation strategies were designed. The workshop also led to the development of the Unit's risk register which is considered an integral part in the effective management of the business.

Regular monitoring of progress on the various tasks allocated to task owners has been conducted and it is envisaged that completion of the various tasks would meet their desired target dates and consequently support the mitigation strategies.

The vision of eThekwini Municipality is “By 2030 eThekwini will be Africa’s most caring and liveable City” hence the Enterprise Risk Management strategy was adopted to provide assurance that the risks that might hinder the City from achieving its objectives and its vision, are managed. It is our aim to conduct identification of the Unit’s future potential risks with a view to alerting management timeously to ensure that adequate time is available for the development and implementation of mitigating strategies. A major risk identified was the potential collapse of the national electricity grid. This was due to the generation shortage at Eskom. The Unit drafted and adopted a ‘black start plan’ as its mitigation strategy.

The Infrastructure Theft Investigation Division is responsible for the identification, investigation and mitigation of infrastructure theft on eThekwini Electricity's reticulation network and electrical infrastructure. Special operations were planned in hot spot areas with the assistance of SAPS.

Our focus on awareness campaigns will continue, where we campaign in the eThekwini area educating communities and other Law Enforcement Departments regarding the impact of infrastructure theft to the economy and also partnering with them in preventing the theft thereof. Currently, our emphasis is on building stronger relationships with the prosecuting authorities to ensure successful convictions.

The information gathered from the proactive monitoring of the electrical network is used to inform the upgrading of the electrical infrastructure and successful convictions.

The mission of eThekwini Electricity is By 2030 eThekwini will be Africa’s most caring and liveable City.

Support the management strategy

The objective of the Division is to ensure effective and efficient support of the operations of the Company to ensure that the Company's and the Group's business objectives are attained.
Statistical data and financial performance
GROWTH OF BUSINESS & GENERAL CUSTOMERS

AVERAGE kWh PER BUSINESS & GENERAL CUSTOMER/MONTH

FINANCIAL YEAR

<table>
<thead>
<tr>
<th>Energy (kWh)</th>
<th>Number of Business &amp; General Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1000</td>
<td>1</td>
</tr>
<tr>
<td>2000</td>
<td>2</td>
</tr>
<tr>
<td>3000</td>
<td>3</td>
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<tr>
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</tr>
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<tr>
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<td>9</td>
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<tr>
<td>10,000</td>
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</tr>
</tbody>
</table>

FINANCIAL YEAR

<table>
<thead>
<tr>
<th>Rand (R)</th>
<th>Energy (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
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<td>1000</td>
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</tr>
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</table>

AVERAGE Income (R) / B&G Customer / Month

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Average Income (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/06</td>
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<td>06/07</td>
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<tr>
<td>14/15</td>
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</table>

Number of B&G Customers

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Number of B&amp;G Customers</th>
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<tbody>
<tr>
<td>05/06</td>
<td>1</td>
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<tr>
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<td>13/14</td>
<td>9</td>
</tr>
<tr>
<td>14/15</td>
<td>10</td>
</tr>
</tbody>
</table>

AVERAGE kWh per Business & General Customer / Month

FINANCIAL YEAR
GROWTH OF CREDIT RESIDENTIAL CUSTOMERS

Number of Credit Residential Customers

FINANCIAL YEAR
14/15 04/05 05/06 06/07 07/08 08/09 09/10 10/11 11/12 12/13 13/14 15/16

FINANCIAL YEAR
14/15 04/05 05/06 06/07 07/08 08/09 09/10 10/11 11/12 12/13 13/14 15/16

AVERAGE kWh PER CREDIT RESIDENTIAL CUSTOMER/MONTH

Energy (kWh)

FINANCIAL YEAR
14/15 04/05 05/06 06/07 07/08 08/09 09/10 10/11 11/12 12/13 13/14 15/16

FINANCIAL YEAR
14/15 04/05 05/06 06/07 07/08 08/09 09/10 10/11 11/12 12/13 13/14 15/16

Average Income (R)

FINANCIAL YEAR
14/15 04/05 05/06 06/07 07/08 08/09 09/10 10/11 11/12 12/13 13/14 15/16

FINANCIAL YEAR
14/15 04/05 05/06 06/07 07/08 08/09 09/10 10/11 11/12 12/13 13/14 15/16

Average kWh

FINANCIAL YEAR
14/15 04/05 05/06 06/07 07/08 08/09 09/10 10/11 11/12 12/13 13/14 15/16

FINANCIAL YEAR
14/15 04/05 05/06 06/07 07/08 08/09 09/10 10/11 11/12 12/13 13/14 15/16

Energy Sold (GWh)

FINANCIAL YEAR
14/15 04/05 05/06 06/07 07/08 08/09 09/10 10/11 11/12 12/13 13/14 15/16

FINANCIAL YEAR
14/15 04/05 05/06 06/07 07/08 08/09 09/10 10/11 11/12 12/13 13/14 15/16

Rand (R)
### Average kWh per Prepayment Customer/Month

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>14/15</th>
<th>04/05</th>
<th>05/06</th>
<th>06/07</th>
<th>07/08</th>
<th>08/09</th>
<th>09/10</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>15/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kWh)</td>
<td>50</td>
<td>100</td>
<td>200</td>
<td>250</td>
<td>250</td>
<td>200</td>
<td>150</td>
<td>100</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>200</td>
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</table>

### Growth of Prepayment Customers

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>14/15</th>
<th>04/05</th>
<th>05/06</th>
<th>06/07</th>
<th>07/08</th>
<th>08/09</th>
<th>09/10</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>15/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Prepayment Customers</td>
<td>500</td>
<td>1000</td>
<td>1500</td>
<td>2000</td>
<td>2500</td>
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<td>4000</td>
<td>4500</td>
<td>5000</td>
<td>5500</td>
<td>6000</td>
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</table>

### Average Income (£) / Prepayment Customer/Month

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>14/15</th>
<th>04/05</th>
<th>05/06</th>
<th>06/07</th>
<th>07/08</th>
<th>08/09</th>
<th>09/10</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>15/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (£)</td>
<td>0.05</td>
<td>0.10</td>
<td>0.15</td>
<td>0.20</td>
<td>0.25</td>
<td>0.20</td>
<td>0.15</td>
<td>0.10</td>
<td>0.05</td>
<td>0.05</td>
<td>0.10</td>
<td>0.15</td>
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</table>

### Average kWh

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>14/15</th>
<th>04/05</th>
<th>05/06</th>
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<th>08/09</th>
<th>09/10</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>15/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kWh)</td>
<td>50</td>
<td>100</td>
<td>200</td>
<td>250</td>
<td>250</td>
<td>200</td>
<td>150</td>
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<td>50</td>
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</table>
OVERALL GROWTH OF CUSTOMERS

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Number of Customers</th>
<th>Energy Sold (GWh)</th>
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</thead>
<tbody>
<tr>
<td>05/06</td>
<td>700 000</td>
<td>2 000</td>
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<tr>
<td>06/07</td>
<td>800 000</td>
<td>4 000</td>
</tr>
<tr>
<td>07/08</td>
<td>1 000 000</td>
<td>6 000</td>
</tr>
<tr>
<td>08/09</td>
<td>1 200 000</td>
<td>10 000</td>
</tr>
<tr>
<td>09/10</td>
<td>1 400 000</td>
<td>12 000</td>
</tr>
<tr>
<td>10/11</td>
<td>1 600 000</td>
<td>14 000</td>
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<tr>
<td>11/12</td>
<td>1 800 000</td>
<td>16 000</td>
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<tr>
<td>12/13</td>
<td>2 000 000</td>
<td>18 000</td>
</tr>
<tr>
<td>13/14</td>
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<td>20 000</td>
</tr>
<tr>
<td>14/15</td>
<td>2 400 000</td>
<td>22 000</td>
</tr>
</tbody>
</table>

OVERALL AVERAGE kWh PER CUSTOMER/MONTH

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Energy (kWh)</th>
<th>Average Income (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/06</td>
<td>0</td>
<td>0</td>
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<tr>
<td>06/07</td>
<td>200</td>
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<td>07/08</td>
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<td>1 600</td>
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<tr>
<td>14/15</td>
<td>1 800</td>
<td>1 200</td>
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<tr>
<td>Financial Year</td>
<td>Number of Employees</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>04/05</td>
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<tr>
<td>05/06</td>
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<td>13/14</td>
<td>4500</td>
<td></td>
</tr>
<tr>
<td>14/15</td>
<td>5000</td>
<td></td>
</tr>
</tbody>
</table>

**Energy Sold Per Employee (GWh) for Financial Years:**

- 04/05: 0 GWh
- 05/06: 3.00 GWh
- 06/07: 4.00 GWh
- 07/08: 5.00 GWh
- 08/09: 6.00 GWh
- 09/10: 7.00 GWh
- 10/11: 8.00 GWh
- 11/12: 2.00 GWh
- 12/13: 1.00 GWh
- 13/14: 0.00 GWh
- 14/15: 0.00 GWh

**Number of Employees for Financial Years:**

- 04/05: 0
- 05/06: 500
- 06/07: 1000
- 07/08: 1500
- 08/09: 2000
- 09/10: 2500
- 10/11: 3000
- 11/12: 3500
- 12/13: 4000
- 13/14: 4500
- 14/15: 5000
Average Monthly FBE Claims

Qualifying Customers Total Claims

May July Aug Sep Oct Nov Dec Jan Feb Mar Apr Jun
0 20 000 60 000 0 140 000 200 000 100 000 150 000 200 000 250 000

15/16 08/09 09/10 10/11 11/12 12/13 13/14
0 40 000 140 000 20 000 60 000 80 000 100 000 120 000

14/15 160 000

Free Basic Electricity Claims Per Month
2015/2016 DISTRIBUTION OF ENERGY SALES

DISTRIBUTION OF REVENUE FROM SALES 2015/2016

- Prepayment: 9%
- Business & General: 20%
- Bulk: 47%
- Private Residences: 23%
- Other: 1%

2015/2016 DISTRIBUTION OF ENERGY SALES

- Prepayment: 8%
- Business & General: 24%
- Bulk: 40%
- Private Residences: 27%
- Other: 1%
DISTRIBUTION OF EXPENDITURE 2015/2016

NEW CONNECTIONS PER REGION 2015/2016

- Central: 3%
- South Western: 16%
- North Western: 16%
- Western: 13%
- Southern: 36%
- Northern: 16%

Depreciation: 3%
Repairs & Maintenance: 5%
Bulk Purchases: 74%
Employee related costs: 9%
Interest paid: 2%
Admin & General: 7%
## Annual Financial Statements

### Statement of Financial Position at 30 June 2016

<table>
<thead>
<tr>
<th></th>
<th>JUNE 2016</th>
<th>JUNE 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASSETS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-current assets</td>
<td>5,703,974</td>
<td>5,429,278</td>
</tr>
<tr>
<td>Property, plant and equipment</td>
<td>5,630,255</td>
<td>5,337,806</td>
</tr>
<tr>
<td>Intangible Assets</td>
<td>18,719,210</td>
<td>17,592,984</td>
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<tr>
<td>Investments</td>
<td>0</td>
<td>20,885,980</td>
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<tr>
<td><strong>Current assets</strong></td>
<td>851,317</td>
<td>594,293</td>
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<tr>
<td>Inventory</td>
<td>1,275,087</td>
<td>1,411,580</td>
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<tr>
<td>Consumer debtors</td>
<td>887,447</td>
<td>1,154,553</td>
</tr>
<tr>
<td>Other debtors</td>
<td>334,062</td>
<td>162,581</td>
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<tr>
<td>VAT</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bank balances and cash</td>
<td>5,702,298</td>
<td>4,484,222</td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td>5,555,291</td>
<td>11,372,215</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>JUNE 2016</th>
<th>JUNE 2015</th>
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</thead>
<tbody>
<tr>
<td><strong>LIABILITIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-current liabilities</td>
<td>1,858,502</td>
<td>2,077,187</td>
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<tr>
<td>Long-term liabilities</td>
<td>1,858,502</td>
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<tr>
<td>Non-current provisions</td>
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<td>0</td>
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<tr>
<td>Current liabilities</td>
<td>833,773</td>
<td>2,572,355</td>
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<tr>
<td>Consumer deposits</td>
<td>1,428,924</td>
<td>1,256,069</td>
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<tr>
<td>Provisions</td>
<td>0</td>
<td>0</td>
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<td>Creditors</td>
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<td>1,240,501</td>
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<tr>
<td>Staff leave</td>
<td>56,207</td>
<td>53,703</td>
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<tr>
<td>Unspent conditional grants and receipts</td>
<td>0</td>
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<tr>
<td>VAT</td>
<td>6,647,259</td>
<td>22,082,243</td>
</tr>
<tr>
<td><strong>Total Net Assets and Liabilities</strong></td>
<td>5,555,291</td>
<td>11,372,215</td>
</tr>
</tbody>
</table>

**NOTE**
### Statement of Financial Performance for the Year Ended 30 June 2016

#### Actuals vs. Adjusted Budget

<table>
<thead>
<tr>
<th>Description</th>
<th>June 2016 Budget</th>
<th>June 2016 Actuals</th>
<th>June 2015 Actuals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong> - from exchange transactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Charges</td>
<td>11 725 722.05</td>
<td>11 725 722.05</td>
<td>11 358 321.369</td>
</tr>
<tr>
<td>Rental of Facilities and Equipment</td>
<td>32 707 113.00</td>
<td>32 707 113.00</td>
<td>31 110 460.23</td>
</tr>
<tr>
<td>Interest Earned</td>
<td>335 089.72</td>
<td>335 089.72</td>
<td>320 131.89</td>
</tr>
<tr>
<td>Interest Earned - Outstanding Debtors</td>
<td>11 454 135.30</td>
<td>11 454 135.30</td>
<td>11 454 135.30</td>
</tr>
<tr>
<td>Other Income</td>
<td>12 124 978.53</td>
<td>12 124 978.53</td>
<td>12 124 978.53</td>
</tr>
<tr>
<td>Public Contributions and Donations</td>
<td>68 820 643.24</td>
<td>68 820 643.24</td>
<td>68 820 643.24</td>
</tr>
<tr>
<td>Gains on disposal of Prop; Plant; Equip</td>
<td>568 454.30</td>
<td>568 454.30</td>
<td>568 454.30</td>
</tr>
<tr>
<td>Internal Income</td>
<td>263 511.09</td>
<td>263 511.09</td>
<td>241 394.79</td>
</tr>
<tr>
<td><strong>Total Revenue from exchange transactions</strong></td>
<td>12 379 483.086</td>
<td>12 379 483.086</td>
<td>11 023 388.109</td>
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<tr>
<td><strong>Revenue</strong> - non-exchange transactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfer revenue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Grants and Subsidies</td>
<td>13 167 850.00</td>
<td>13 167 850.00</td>
<td>157 231.000</td>
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<tr>
<td><strong>Total Revenue from non-exchange transactions</strong></td>
<td>167 850.000</td>
<td>167 850.000</td>
<td>186 541.089</td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td>12 547 333.086</td>
<td>12 543 810.860</td>
<td>11 209 929.198</td>
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<tr>
<td><strong>Expenditure</strong></td>
<td></td>
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<tr>
<td>Employee Related Costs</td>
<td>14 901 810.117</td>
<td>14 901 810.117</td>
<td>157 231.000</td>
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<tr>
<td>Contribution to Provision for Bad Debts</td>
<td>228 353.25</td>
<td>228 353.25</td>
<td>241 394.79</td>
</tr>
<tr>
<td>Depreciation</td>
<td>306 001.999</td>
<td>306 001.999</td>
<td>270 984.630</td>
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<tr>
<td>Repairs and Maintenance</td>
<td>523 407.672</td>
<td>523 407.672</td>
<td>584 156.756</td>
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<tr>
<td>Interest Paid</td>
<td>15 226 261.126</td>
<td>15 226 261.126</td>
<td>12 240 209.23</td>
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<td>Bulk Purchases</td>
<td>16 7 735 740.533</td>
<td>16 7 735 740.533</td>
<td>12 795 015.27</td>
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<td>Contracted Services</td>
<td>135 868 987.210</td>
<td>135 868 987.210</td>
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<td>General Expenses</td>
<td>190 786 692.220</td>
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<td>Loss on disposal of Prop; Plant; Equip</td>
<td>9 839 525.000</td>
<td>9 839 525.000</td>
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<tr>
<td>Internal Charges</td>
<td>389 551.584</td>
<td>389 551.584</td>
<td>382 662.989</td>
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<td><strong>Total Expenditure</strong></td>
<td>10 479 436.182</td>
<td>10 479 436.182</td>
<td>9 453 297.636</td>
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<tr>
<td><strong>Operating Surplus</strong></td>
<td>2 067 896.904</td>
<td>2 067 896.904</td>
<td>1 756 631.561</td>
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<td>Cross Subsidisation</td>
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<td>-927 553.330</td>
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<td>Other</td>
<td>-1 140 343.574</td>
<td>-1 140 343.574</td>
<td>-979 868.813</td>
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<tr>
<td><strong>Surplus for the Year</strong></td>
<td>0</td>
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</table>

**NOTE**

- Actuals
- June 2015
- June 2016
- Actuals

Reconciliation of Surplus for the year 2016

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<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Surplus for the year</td>
<td>1,140,343,574</td>
</tr>
<tr>
<td>Capital Replacement Reserve</td>
<td>0</td>
</tr>
<tr>
<td>PPE Purchased:</td>
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</tr>
<tr>
<td>Capital Grants used to purchase PPE</td>
<td>0</td>
</tr>
<tr>
<td>Donations and Public Contributions</td>
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</tr>
<tr>
<td>Offsetting of Depreciation</td>
<td>0</td>
</tr>
<tr>
<td>Total Received for the Year</td>
<td>1,140,343,574</td>
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### Housing Capital Capitalisation

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>Surplus / (Deficit)</th>
<th>Transfer to Capital Replacement Reserve</th>
<th>PPE Purchased</th>
<th>Capital Grants used to purchase PPE</th>
<th>Donated / contributed PPE</th>
<th>Contribution to Insurance Reserve</th>
<th>Insurance claims processed</th>
<th>Transfer to Housing Development Fund</th>
<th>Offsetting of Depreciation / Asset Disposals</th>
<th>Transfer Grants and Contribution reserves to Accumulated Surplus</th>
<th>Balance at 30 June 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELECTRICITY</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
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<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>1,140,343,574</td>
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<tr>
<td>Transfer to Capital Replacement Reserve</td>
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<td>-1,140,343,574</td>
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<tr>
<td>PPE purchased</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>2,779,697.82</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td></td>
</tr>
<tr>
<td>Donated / contributed PPE</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Contribution to Insurance Reserve</td>
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<tr>
<td>Insurance claims processed</td>
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</tr>
<tr>
<td>Transfer to Housing Development Fund</td>
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<tr>
<td>Offsetting of Depreciation / Asset Disposals</td>
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<td>0</td>
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</tr>
<tr>
<td>Closing Balance at 30 June 2015 as restated</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>3,730,143.59</td>
<td></td>
</tr>
<tr>
<td>Surplus / (Deficit) for the year</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>1,140,343,574</td>
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<tr>
<td>Transfer to Capital Replacement Reserve</td>
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<td>0</td>
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<td>0</td>
<td>-1,140,343,574</td>
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<tr>
<td>PPE purchased</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2,779,697.82</td>
<td></td>
</tr>
<tr>
<td>Capital Grants used to purchase PPE</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Donated / contributed PPE</td>
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<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Contribution to Insurance Reserve</td>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Insurance claims processed</td>
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<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Transfer to Housing Development Fund</td>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Offsetting of Depreciation / Asset Disposals</td>
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<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Transfer Grants and Contribution reserves to Accumulated Surplus</td>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1,140,343,574</td>
<td></td>
</tr>
<tr>
<td>Balance at 30 June 2016</td>
<td>3,730,143.59</td>
<td></td>
<td>0</td>
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<td>0</td>
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<td>0</td>
<td>4,132,701.354</td>
<td></td>
</tr>
</tbody>
</table>

**Account Name:** Electricity

**ELECTRICITY**

### Balance at 30 June 2016

- Opening Balance: 2,124,737,551
- Surplus for the year: 0
- Transfer to Capital Replacement Reserve: 0
- PPE purchased: 0
- Capital Grants used to purchase PPE: 0
- Donations and Public Contributions: 0
- Offsetting of Depreciation: 0
- Total: 2,124,737,551

### Closing Balance at 30 June 2015

- Opening Balance: 2,869,965,340
- Surplus for the year: 0
- Transfer to Capital Replacement Reserve: 0
- PPE purchased: 0
- Capital Grants used to purchase PPE: 0
- Donations and Public Contributions: 0
- Offsetting of Depreciation: 0
- Total: 2,869,965,340

**Total:** 5,994,703,091
### 1. LONG-TERM LIABILITIES

<table>
<thead>
<tr>
<th>Description</th>
<th>June 2016</th>
<th>June 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Bank of South Africa</td>
<td>1,217,824</td>
<td>1,536,926</td>
</tr>
<tr>
<td>European Investment Bank</td>
<td>59,094</td>
<td>70,725</td>
</tr>
<tr>
<td>RMB &amp; FRB external Loans</td>
<td>203,279</td>
<td>52,585</td>
</tr>
<tr>
<td>Nedbank Loan</td>
<td>242,375</td>
<td>55,660</td>
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<tr>
<td>ABSA Loan</td>
<td>135,929</td>
<td>361,291</td>
</tr>
<tr>
<td><strong>Total External Loans</strong></td>
<td>1,858,503</td>
<td>2,077,188</td>
</tr>
</tbody>
</table>

### 2. CONSUMER DEPOSITS

<table>
<thead>
<tr>
<th>Description</th>
<th>June 2016</th>
<th>June 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity Deposits</td>
<td>1,324,633</td>
<td>1,179,569</td>
</tr>
<tr>
<td>Guarantees in Lieu of Deposits</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Interest on Consumer Deposits</td>
<td>104,291</td>
<td>76,500</td>
</tr>
<tr>
<td><strong>Total Consumer Deposits</strong></td>
<td>1,428,925</td>
<td>1,256,070</td>
</tr>
</tbody>
</table>

*Note: Interest on consumer deposits is accrued at an effective rate of 3.00% per annum and paid to consumers when deposits are refunded.*

### NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 30 JUNE 2016

- **Trade Creditors:** VAT paid over to SARS when goods are delivered.
- **Payments Received in Advance:** VAT is payable on the receipts basis.
- **Retentions:**
- **Other Creditors:**
- **Guarantees in Lieu of Deposits:**
- **VAT Payable:**
- **VAT is payable on the receipts basis.** Only once payment is received from debtors is VAT paid over to SARS.
<table>
<thead>
<tr>
<th></th>
<th>Land</th>
<th>Buildings</th>
<th>Infrastructure</th>
<th>Plant &amp; Equip.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>174 311</td>
<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS</td>
<td>174 311</td>
<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 0.25% IFRS</td>
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<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 0.5% IFRS</td>
<td>174 311</td>
<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 0.75% IFRS</td>
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<td>13 174 172</td>
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<td>2 249 002</td>
<td>2 249 002</td>
</tr>
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<td>2.5% IFRS + 1% IFRS</td>
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<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 1.25% IFRS</td>
<td>174 311</td>
<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 1.5% IFRS</td>
<td>174 311</td>
<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 1.75% IFRS</td>
<td>174 311</td>
<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
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<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 2.25% IFRS</td>
<td>174 311</td>
<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 2.5% IFRS</td>
<td>174 311</td>
<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 2.75% IFRS</td>
<td>174 311</td>
<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 3% IFRS</td>
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<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
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<td>2.5% IFRS + 3.25% IFRS</td>
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<td>13 174 172</td>
<td>2 249 002</td>
<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 3.5% IFRS</td>
<td>174 311</td>
<td>13 174 172</td>
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<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
<td>2.5% IFRS + 3.75% IFRS</td>
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<td>13 174 172</td>
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<td>2 249 002</td>
<td>2 249 002</td>
</tr>
<tr>
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<tr>
<td>Carrying Values at 1 July 2014</td>
<td>131 531</td>
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<td>225 123</td>
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<td>143 214 914</td>
<td>4 731 858</td>
<td>121 331 154 807</td>
<td>5 337 800 006</td>
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<td>Cost</td>
<td>131 572</td>
<td>143 214 914</td>
<td>4 731 858</td>
<td>121 331 154 807</td>
<td>5 337 800 006</td>
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<tr>
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<td>143 214 914</td>
<td>4 731 858</td>
<td>121 331 154 807</td>
<td>5 337 800 006</td>
</tr>
</tbody>
</table>
6. INVESTMENTS

C.I.F. Investment 0 20 885 980

Investments held in the Consolidated Investment Fund are invested in accordance with Municipal Investment Regulations which forms part of the Municipal Finance Management Act, No. 56 of 2003.

Moneys were invested in fixed deposits and call deposits with the Banks, earning an average interest rate of 5.993% (2014) and 5.518% (2013)

7. INVENTORY

Stock on hand 127 508 927 141 580 194

8. CONSUMER DEBTORS

GROSS PROVISION

BALANCES FOR BAD DEBTS NET BALANCES

As at 30 June 2016

Service Debtors 1 136 978 492 -249 531 216 887 447 276
Total 1 136 978 492 -249 531 216 887 447 276

As at 30 June 2015

Service Debtors 1 350 459 888 -195 906 815 1 154 553 072
Total 1 350 459 888 -195 906 815 1 154 553 072

Electricity: Ageing

- Current (0 - 30 days) 693 135 743 875 085 254
- 31 - 60 Days 126 239 021 188 026 153
- 61 - 90 Days 27 921 861 27 830 165
- 91 - 120 Days 24 360 964 28 147 877
- 121 - 365 Days 265 320 902 231 370 438
- +365 Days 0

Total 1 136 978 492 1 350 459 887
### Summary of Debtors by Customer Classification

**30 June 2016**

<table>
<thead>
<tr>
<th>Classification</th>
<th>0 - 30 Days</th>
<th>31 - 60 Days</th>
<th>61 - 90 Days</th>
<th>91 - 120 Days</th>
<th>121 - 365 Days</th>
<th>+365 Days</th>
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<td>70,610</td>
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<td>Commercial</td>
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<td>752,550</td>
<td>933,033</td>
<td>2,987</td>
<td>571,828</td>
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<td>Indus. Fleet</td>
<td>198,198</td>
<td>172,922</td>
<td>2,987</td>
<td>5,225</td>
<td>817,331</td>
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<td>1,198,385</td>
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<td><strong>Total</strong></td>
<td>866,021</td>
<td>2,725,796</td>
<td>2,725,356</td>
<td>11,347</td>
<td>2,725,458</td>
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<td><strong>6,759,765</strong></td>
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</table>

Less: Provision for bad debts
- 190,064
- 59,466
- **Total debtors by customer classification**
- 6,759,765
- 6,569,299
- 6,070,233
- 5,473,867
- 4,878,371
- 4,283,885
- 3,690,389
- 3,098,893
- 2,507,397
- 1,915,891
- 1,324,395
- 732,899
- 541,393
- 350,897
- 159,391
- 52,895
- 44,920
- 37,945
- 30,970
- **Total debtors by customer classification**
- 6,569,299
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- 37,945
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- 37,945
- 30,970
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- 44,920
- 37,945
- 30,970
- **Total debtors by customer classification**
- 37,945
- 30,970
- **Total debtors by customer classification**
- 30,970
- **Total debtors by customer classification**

### Reconciliation of bad debts provision

**Balance at beginning of the year**
- 195,906,815
- 171,158,356

**Contributions to Provision**
- 71,194,022
- 71,938,324

**Bad debts written off against provision**
- 17,569,622
- 3,189,865

**30 June 2015**
- 249,531,216
- 195,906,815
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<th>June 2016</th>
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<td>00108 - Prepayment Meters</td>
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<td>853 913</td>
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<td>3 415 826</td>
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<td>00111 - Sundry Income - Private Lights</td>
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<td>0 26 250 000</td>
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**Total Other Income** 124 978 529 145 079 670 190 151 404
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<td>Current year receipts</td>
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<td>133 527 984</td>
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<td>Conditions met - transferred to revenue</td>
<td>-137 850 000</td>
<td>-133 527 984</td>
<td>-94 266 000</td>
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<td>Conditions still to be met - transferred to liabilities</td>
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*Conditions met* to be met: presented to revenue
*Conditions still to be met* to be presented to liabilities

_June 2016_
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**Total Bulk Purchases**

Total Bulk Purchases:
- Eskom - Maximum Demand Charge
- Eskom - Unit Charge
- Service Fees
- Elect - Landfill Site - Marianhill
- Elect - Hullet Sugar
- Elect - Landfill Site - Bisasar Road
- Energy Charge (Peak)
- Energy Charge (Std)
- Energy Charge (Off-Peak)
- Rate Rebalancing Levy
- Environmental Levy
- Eskom - Admin. Charge
- Transmission Network Charge
- Residual Connection Charge
- KVARH Surcharge
- Energy Charge
- Energy Charge
- Co-Generation Energy
- Co-Generation Energy (Res)
- Co-Generation Energy (Gen)
- Co-Generation Energy (Fac)

**Total Capital Committed**

Total Capital Committed:
- Electricity
- Electricity
21. LOSS IN ELECTRICITY DISTRIBUTION

Estimated Electricity losses 1 197 963 034 kWh (2015: 849 426 488 kWh) occurred during the year under review which resulted in revenue losses to the municipality. These estimated electricity losses amounted to R 828m (2015: R 566m). The national norm for electricity losses ranges from 5.6% to 12%. The loss incurred by the municipality is 10.71% (2015: 7.70%) and is due to a combination of transmission/distribution losses and losses due to illegal connections.

Note: The losses is incorrectly inflated due to a series of issues affecting the reporting system. The reporting system only considers an electricity sale upon the input of a meter reading into the system. The lack of meter readings entered into the system will have the undue effect of understating sales, leading to the overstatement of the calculated losses.

Meter reads entered into the system was affected by 3 main factors:
• Delays in meter reading contracts
• In order to improve billing accuracy, the upper and lower acceptance limits on the billing system were revised. This lead to the under or overestimation of number of readings in the system.
• Migration to a new billing system (RMS) interrupted the loading and capturing of meter reads. This had the undue effect of meter reads not acknowledged by the system.

As meter readings are consistently entered into the new billing system (RMS), this anomaly is expected to decline in losses.

22. OPERATING COMMITMENTS CONTRACTED FOR

Payable in one year 70 517 284
Payable within two to three years 14 322 112
Payable after three years 2 800 102

JUNE 2016 JUNE 2015

RR

18. INTANGIBLE ASSETS

Servitudes
Opening Balance (July 2015) 50 107 586
Acquisitions 4 515 350
Disposals - Cost 0
54 622 936

Computer Software
Opening Balance (July 2015) 20 485 398
Acquisitions 5 668 695
Disposals -8 292 463
Depreciation for the year 7 038 271
19 096 274

19. VAT

Vat Receivable

20. BANK AND CASH BALANCES

5 502 450
934
4 484 222
413
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<th>14/15</th>
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### Units Growth

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### Cents/Unit

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<td>1.82%</td>
<td>-2.18%</td>
<td>0.04%</td>
<td>-0.81%</td>
<td>-0.35%</td>
<td>-0.50%</td>
<td>-1.82%</td>
<td>-3.44%</td>
<td>-1.99%</td>
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<tr>
<td><strong>Prepayment</strong></td>
<td>14.33%</td>
<td>11.05%</td>
<td>5.35%</td>
<td>7.37%</td>
<td>4.91%</td>
<td>1.92%</td>
<td>4.66%</td>
<td>-0.80%</td>
<td>2.57%</td>
<td>4.44%</td>
<td>1.83%</td>
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<tr>
<td><strong>Bulk</strong></td>
<td>3.15%</td>
<td>0.96%</td>
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<td>-8.27%</td>
<td>-0.83%</td>
<td>1.83%</td>
<td>2.47%</td>
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<td>0.19%</td>
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<td>5.31%</td>
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<td>5.00%</td>
<td>18.09%</td>
<td>5.00%</td>
<td>5.00%</td>
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<td><strong>Business &amp; General</strong></td>
<td>-6.91%</td>
<td>14.54%</td>
<td>1.90%</td>
<td>0.10%</td>
<td>20.73%</td>
<td>9.74%</td>
<td>-6.79%</td>
<td>-13.06%</td>
<td>-4.41%</td>
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<td>-3.64%</td>
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### Units (kWh)

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<th>06/07</th>
<th>07/08</th>
<th>08/09</th>
<th>09/10</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>14/15</th>
<th>15/16</th>
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<td><strong>Private Residences</strong></td>
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<td>145</td>
<td>1090</td>
<td>087</td>
<td>1150</td>
<td>334</td>
<td>1416</td>
<td>755</td>
<td>1783</td>
<td>2153</td>
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<td>573</td>
<td>3355</td>
<td>240</td>
<td>542</td>
<td>3638</td>
<td>315</td>
<td>4599</td>
<td>348</td>
<td>5786</td>
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<td>183</td>
<td>275</td>
<td>381</td>
<td>491</td>
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<td>494</td>
<td>949</td>
<td>684</td>
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<td>175</td>
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<td>863</td>
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<td>1096</td>
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<td>19709</td>
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<td>36500</td>
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<td>4419</td>
<td>4254</td>
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</table>

### Notes on Growth

- Percentage changes indicate growth or decline in customer base.
- Negative percentages reflect decreases in customer numbers.

- Units growth data shows steady increases across different categories.

- Cents/Unit statistics reflect pricing trends, highlighting changes in unit costs.

- Total units show substantial growth over the years, reflecting market expansion.
<table>
<thead>
<tr>
<th>Year</th>
<th>Maximum Demand (kWh)</th>
<th>Percent Growth</th>
<th>Average Load Factor</th>
<th>Energy Sold (kWh)</th>
<th>Percent Growth</th>
<th>Energy Sold (kWh)</th>
<th>Energy Sold (kWh)</th>
<th>Percent Growth</th>
<th>Energy Sold (kWh)</th>
<th>Percent Growth</th>
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<tbody>
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<td>7,426</td>
<td>490</td>
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<td>7,697</td>
<td>306</td>
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<td>100.00%</td>
<td>290,070</td>
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<td>1,286</td>
<td>1.40%</td>
<td>7,548</td>
<td>345</td>
<td>1.65%</td>
<td>7,928</td>
<td>199</td>
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<td>97.50%</td>
<td>299,948</td>
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<tr>
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<td>852</td>
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<td>8,145</td>
<td>531</td>
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<td>99.90%</td>
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<td>98.00%</td>
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<tr>
<td>03/04</td>
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<td>1.08%</td>
<td>10,290</td>
<td>595</td>
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<td>10,803</td>
<td>948</td>
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<td>99.80%</td>
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<td>11,186</td>
<td>110</td>
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<td>95.57%</td>
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<td>990</td>
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<td>467</td>
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<td>957</td>
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**Statistical Data:**

- **Maximum Demand and Energy Sales per Annum**
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<tr>
<th>Year</th>
<th>Admin and General</th>
<th>Distribution</th>
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<td>468</td>
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<tr>
<td>05/06</td>
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<td>287</td>
</tr>
<tr>
<td>06/07</td>
<td>230</td>
<td>044</td>
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<tr>
<td>07/08</td>
<td>624</td>
<td>248</td>
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<tr>
<td>08/09</td>
<td>140</td>
<td>674</td>
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<tr>
<td>09/10</td>
<td>246</td>
<td>868</td>
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<tr>
<td>10/11</td>
<td>766</td>
<td>564</td>
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<tr>
<td>11/12</td>
<td>654</td>
<td>682</td>
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<td>12/13</td>
<td>479</td>
<td>321</td>
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<td>13/14</td>
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**Sub Total**: 705,961,274

**% Increase**: 8%

**% of Total Expenditure**: 24%

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<th>Durban Metro</th>
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<td>181</td>
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<td>06/07</td>
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<td>469</td>
<td>274</td>
<td>287</td>
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<td>07/08</td>
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</table>

**Sub Total**: 319,599,743

**% Increase**: 14%

**% of Total Expenditure**: 11%

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<tr>
<th>Year</th>
<th>Loan Charges</th>
<th>Interest Paid</th>
<th>Electricity Purchased</th>
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<tr>
<td>07/08</td>
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<tr>
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<td>10/11</td>
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<td>11/12</td>
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<td>13/14</td>
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**Sub Total**: 316,056,450

**% Increase**: 0%

**% of Total Expenditure**: 11%