



# Electricity

FOR OUR COMMUNITIES



ETHEKWINI ELECTRICITY

# Annual Report

2013 - 2014



# Vision & MISSION

Deputy Heads of Departments (Left to right): Roy Wienand (MV/LV); Raj Dhrochand (HV); Sew Harilal (Customer & Retail Services); Veer Ramnarain (Technical Support)

## OUR VISION

EThekwini Electricity - a leader in electricity distribution providing energy for the future.

## OUR MISSION

To provide electricity, public lighting and other energy services that satisfy our customers and community whilst maintaining sound business principles.

## STRATEGY

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

## SCOPE

EThekwini Electricity supplies more than 723 593 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 at lower voltages from Eskom for Winkelspruit, 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).

# Head's OVERVIEW

As each financial year passes my appreciation for my team grows as they face ever-increasing challenges. It was hoped that we had seen the last of load shedding after the crippling 2008 load sheddings made the citizens of South Africa more aware of their roles and responsibilities in reducing the nation's energy consumption. Unfortunately, this was short lived as eThekweni Municipality was forced to deal with rotational load shedding in order to stabilise the network as Eskom's generation failed to meet demand. This promises to become a regular occurrence until the aging network is bolstered by the new Medupi and Kusile power stations.

Total Revenue increased by 3.2 % to 10.4 billion. Eskom Bulk electricity purchases accounted for 71 % of our total expenditures. In a continual effort to keep our assets in good operating order R 613 million was spent on the repair and maintenance of our electrical infrastructure. The balance was spent on human resources, general expenses and much needed infrastructure projects. Bear in mind we have a staff complement of 2 286 people, and 723 593 customers

The National Energy Regulator of South Africa (NERSA) approved a price increase of 8 % per annum instead of Eskom's requested 16 %. With some of our tariffs restructured to better align to the Eskom's charges the Electricity Unit was able to keep the average increase down to only 5.5 %. Residential customers saw an increase of 4.95 % while business and industries increase ranged from 6 % to 7.25 % which depended on seasonality and time of use.

Electricity and cable theft remains a constant challenge. Not only does it cause power outages to communities, but increases maintenance and repair costs which affect future tariff increases negatively.

The Unit experienced a 6.11 %, or approximately R 424 million in lost revenue. Cable theft was at an all time high, costing municipalities across the country in excess of R 5 billion. Efforts are continuing in the struggle to dissuade citizens from stealing infrastructure. Currently discoloured copper-clad steel is being investigated as an alternative as it has little scrap value.

Since the Approval of the policy for the electrification of informal settlements by eThekweni Council, eThekweni Electricity has embarked rigorously on the electrification of these areas. To date, 23 Informal settlements and 21 transit camps have been completed increasing the number of eThekweni residents by 11 208. This is still far from our 125 282 electrification goal and this is exacerbated by Urban influx.

Finally, I would like to thank all the staff of the Unit for contributing to the successful 2013/2014 financial year. Their hard work and dedication proving once more that eThekweni Electricity can rise above any obstacle that is presented to it.



RS MAPHUMULO



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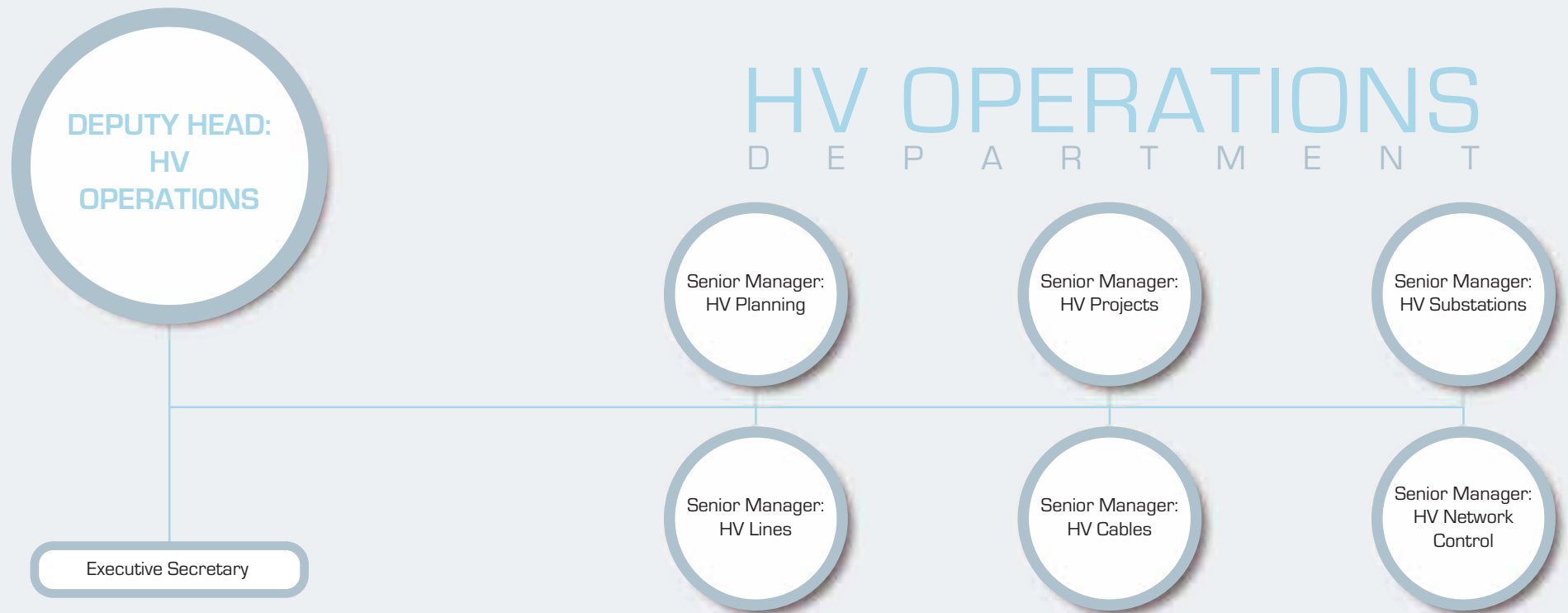
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Planning, construction,  
operation and maintenance  
of high voltage lines,  
cables and substations

The HV Operations Department is responsible for the planning, construction, operation and maintenance of eThekweni 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 regions HV electricity supply.

Accordingly they are typically large, high cost projects which require considerable time and attention to satisfy environmental legislation in the first instance and then 30 months or more in the construction phase.

Our Department prides itself in providing reliable, state of the art solutions for the delivery of high voltage power from our intake points to our customers and secondary networks.

## HV Planning Branch

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 and 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 is also completed by the Branch.

### Highlights

- ▶ Handed over the following to HV Projects Branch for execution:
  - Establishment of 132/11 kV Bulwer Substation.
  - Establishment of 132/11 kV Mahogany Ridge Substation.
  - Establishment of 132 kV Stockville Switching Station
  - Upgrade of 132/11 kV La Mercy Substation.
- ▶ Acquired servitude from Transnet for new 132 kV supply cables to Sapref.
- ▶ Acquired servitude for Stockville/Mahogany Ridge 132 kV overhead line.

### Progress on existing projects

- ▶ 132/11 kV Austerville Substation - Land acquisition stage
- ▶ 132/11 kV Frametex Substation - Land acquisition stage
- ▶ 132/11 kV Inyaninga 1 Substation - Investigation stage
- ▶ 132/11 kV Inyaninga 2 Substation - Investigation stage
- ▶ 132 kV Klaarwater
  - Hillcrest overhead line upgrade from Westmead Tee to Hillcrest Substation - Feasibility study completed
  - Umgeni overhead line upgrade - Design proposal stage
- ▶ 132/11 kV Kloof Substation - Land acquisition stage
- ▶ 132/11 kV Phoenix Central Substation - Land acquisition stage
- ▶ 132 kV Verulam Switching Station - Land acquisition stage
- ▶ 132/11 kV Verulam Substation - Land acquisition stage
- ▶ 132/11 kV Woodlands Substation - Design proposal stage
- ▶ 275/132 kV Bellair Substation - Design proposal stage
- ▶ 275 kV Durban North Substation Yard upgrade - Preliminary design stage
- ▶ 275/132/11 kV Ottawa Substation upgrade - Design proposal stage

### Key challenges

- ▶ Long acquisition time lines for sites and servitudes - Resolution: foster a closer working relationship with Real Estates Unit.
- ▶ Long turn-around times for wayleave approvals by third parties - Resolution: meet with management of third parties with a view to agreeing on an approval process and reasonable turn-around time for both parties.
- ▶ Registering servitudes for properties where HV infrastructure exists without servitude agreements - Resolution: work jointly with Real Estates Unit to work through backlog.

### Achievements

- ▶ HV Planning Engineers are in the process of updating Geographical Load Forecasting model in-house rather than outsourcing this activity to the private sector.
- ▶ Started developing in-house over head transmission line design skills.
- ▶ Commenced with network reliability programmes for access to overhead transmission line towers and security of LV supply to transmission substations.
- ▶ Development of asset replacement programme for 11 kV oil circuit breakers nearing completion.
- ▶ All HV Planning engineers have attended training on the DigSilent power system analysis software and the update of the DigSilent network model is in progress.

## HV Projects Branch

The HV Projects Branch is responsible for the detailed design and specification of equipment and management of major system reinforcement projects. There were 28 projects in progress during the 2013/2014 year.

### Progress on existing projects

- ▶ Phoenix Industrial 132/11 kV Substation: Replace the ageing and unreliable 11 kV switchgear. Second phase in progress.
- ▶ Hillcrest 132/11 kV Substation: Replace the ageing and unreliable 11 kV switchgear. Completed.
- ▶ Umbogintwini 132/33 kV Substation: Replace the 33/11 kV transformers with 132/11 kV transformers and associated equipment. Commissioned.
- ▶ Umhlanga Ridgeside 132/11 kV Substation: Provide new supply to the various Umhlanga developments and also facilitate the de-commissioning of the old and unreliable Umhlanga and Glenashley 33/11 kV Substations. Commissioned.
- ▶ 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 their associated equipment is in progress.

- ▶ **Mondi 132/33 kV Substation:** Establish a new 132/33 kV substation to increase reliability to large industrial customers in the Southern Industrial Basin. New 142 MVA 132/33 kV transformers have been installed. The 33 kV switchgear and feeder cables are on order.
- ▶ **Pinetown 132/11 kV Substation:** Upgrade the firm capacity needs to be upgraded as the commercial and residential load demand in the Pinetown, New Germany and Cowies Hill areas has increased. First phase commissioned.
- ▶ **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 and are in its final stages of being commissioned. Project nearing completion.
- ▶ **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. Advanced stage of pre-commission testing of the plant.
- ▶ **Havenside 132/11 kV Substation:** The commercial and residential load demand in the Chatsworth area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. 132 kV switchgear has been installed and final testing is in progress.
- ▶ **Karim Lane 33/11 kV Substation:** Replace the 11 kV switchgear was required due to its age and unreliability. Commissioned.
- ▶ **Ridgeview 132/11 kV Substation:** Reinforce the 11 kV systems as the commercial and residential load demand in the Cato Manor area has increased. Awaiting final energising.
- ▶ **Mobeni South 132/11 kV Substation:** The commercial and residential load demand in the Mobeni South area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Advanced stage of pre-commission testing of the plant.
- ▶ **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 relocated. New transformers on order.
- ▶ **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. Pre commission testing in progress.
- ▶ **Plangweni 132 kV Substation:** New 132 kV switchyard required to feed the Transnet Pump station. All primary plant has been installed and final testing in progress.
- ▶ **Chamberlain Road 33/11 kV Substation:** Replacement of the 11 kV switchgear required due to its age and unreliability. To follow after completion of Karim Lane project due to availability of temporary 11kV switchboard.
- ▶ **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 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. Installation of plant and equipment in progress.
- ▶ **Sapref 132/33 kV Substation:** The 33 kV supply to Sapref Refinery replaced with more secure supply from the new Sapref Substation. Installation of plant and equipment in progress.
- ▶ **Durban South 275 kV Bus Section:** Required to improve the security of supply at this strategic substation. Installation of plant and equipment in progress.
- ▶ **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. Civil work and plant procurement 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 tender process in progress.
- ▶ **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 tender process 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 tender process in progress.
- ▶ **La Mercy 132/11 kV Substation:** 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.

## HV Substations Branch

The HV Substations Branch is responsible for the operation and maintenance of equipment ranging from 11 kV up to 275 kV. There are five National Key Point substations that import energy from Eskom at 275 kV. The 275 kV is then transformed to 132 kV, 132 kV transformed to 33 kV and 11 kV, and 33 kV is then transformed to 11 kV and in few cases to 6,6 kV. The types of equipment that the HV Substation Branch is responsible for includes, but not limited to, busbars, capacitors, instrument transformers, lightning masts, power line carriers, power transformers, surge arresters and switchgear.

### Highlights

- ▶ The diagnostic testing and condition monitoring programs have been improved.
- ▶ The completion of online assessment of all power transformers by an external service provider, Doble Africa. This power transformer fleet screening has provided the HV Substations Branch an understanding of the condition of each transformer thereby allowing for the proper planning and prioritisation of maintenance.

- There was significant progress on the repair of the strategic Lotus Park 275/132 kV transformer which has been out-of-commission since 2011. This transformer is expected to be back in service within the second quarter of 2014/2015.
- The completion of the replacement programme of problematic 132 kV surge arresters.
- The filling of 5 Small Plant Operator vacancies which has allowed for an effective grass cutting services within the substations.

### Lowlights

- The incidents of copper theft in HV substations are on the rise and they are threatening the functionality of substations.
- The delay in the installation of CCTV cameras in substations to deter the prospective copper thieves.
- The resignation of 3 key staff at the branch, namely, Senior Manager, Engineer and HV Inspector.
- The outages at Rossburgh Substation due to the catastrophic failures of the switchgear and the transformer.

### Challenges

The oil circuit breakers are of old technology that render themselves uneconomical to maintain and unsafe to operate. Consequently they are gradually being phased out and replaced by vacuum and gas circuit breakers. However there is still a large number of oil circuit breakers present in substations especially at 11 kV and also at 33 kV. As a result more resources (staff, labour, material, and time) are spent on maintaining this type of switchgear.

There are frequent problems associated with their old age such as shortage of spares and mal-operation and severe failures. The decision was taken to phase out 33 kV plant and equipment because of age and other associated problems such as unavailability of spares and multi transformation. The decommissioning of such plant and equipment has been made possible by construction of new 132/11 kV substations.

### Future Plans

- Securing the Service Level Agreements (SLA) with the Original Equipment Manufacturers (OEM). This will ensure that specialist skills are provided by the OEMs when required to undertake planned maintenance and to respond timeously to breakdowns.
- Filling of critical vacancies which will enhance the productivity and effectiveness of the HV Substations Branch.
- Securing of additional posts through the proposed organogram changes which will allow the HV Substations Branch to significantly reduce the maintenance backlog.
- To make significant progress in the compilation and implementation of once-off and periodic Network Reliability Programmes (NRP).

- To compile Emergency Response Plans (ERP) to ensure the branch's readiness to response effectively to identified network emergencies.

## HV Lines Branch

The HV Lines Branch is responsible for the operation and maintenance of the high voltage overhead lines consisting of 141 circuit kilometres of 275 kV, 478 circuit kilometres of 132 kV and 13 circuit kilometres of 33 kV overhead lines.

### Key Challenges

- There are still ongoing theft of tower steel members in spite of the branch embarking on increasing patrols on its HV lines and the installing of theft detection devices to facilitate early warning and quick response.
- Suitable off road (4x4) vehicles is becoming quite a challenge as the access roads are becoming more difficult to negotiate with the encroachment of informal settlements and developments within the power line corridors.
- Maintaining a full complement of trained staff is still a challenge due to high number of vacancies and movement within various departments and the country as a whole.

### Achievements

- The Branch has completed the procurement and installation of 250 theft detection devices on contract (E.9135) for early warning in order to minimise the theft of tower steel members.
- The Branch has also awarded a bush clearing contract (E.9118) in order to effectively ensure that all structures including access roads are clear for easy access and effective maintenance.
- The Branch has also embark on the installation of bird guard devices in order to minimise electrical network faults caused by birds and/or their droppings and also to protect the environment by minimising bird electrocution.
- Refurbishment project (E8960) is in progress with the following stages of completion
 

- 132 kV Avoca	- Tee Ottawa	90 %
- 132 kV Bellair	- Mayville	100 %
- 132 kV Bellair	- Rossburgh	100 %
- 132 kV Durban Noth	- Parkhill	60 %
- 132 kV Durban South	- Lotus Park	100 %
- 132 kV Ottawa	- Canelands	90 %
- 132 kV Ottawa	- Parlock	70 %
- 132 kV Tee Duffs Road		100 %
- 132 kV Tee Marianridge		80 %
- 132 kV Tee SATS Canelands		10 %
- 275 KV Avon	- Ottawa	100 %
- 275 kV Ottawa	- Durban North	100 %



- ▶ All management and supervisory staff have attended PRAGMA asset management courses which were aimed at improving managing of assets and the utilising best practices and policies, while meeting GRAP 17 requirements.
- ▶ 3 out of 4 staff enrolled on 275 kV switching authorisation training, have successfully achieved their switching authorisation. 3 additional staff are in the process of being trained.
- ▶ The Branch has also successfully employed 2 HV Electrical Inspectors to achieve a full complement of 4 HV Electrical Inspectors to eliminate network inspection backlog.
- ▶ As part of improving skills of staff in the Branch, some of the staff has attended the HV Lines Maintenance Course, Infrared Scanning Course and also Design and Construction Course.

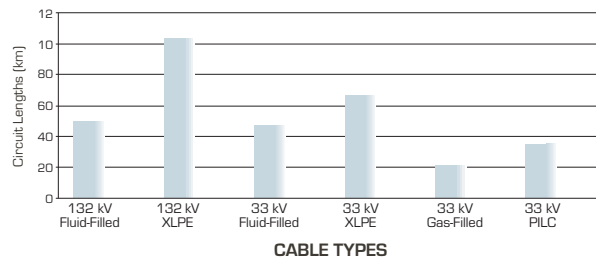
### Future Plans

- ▶ The Branch is motivating for the building of a specialised line to assist with training of HV Lines staff. This line would be used as training for climbing and working at heights safely and ensure effective infrastructure maintenance.
- ▶ To procure and install more additional tower steel theft detection devices to achieve at least 80 % monitoring of the high voltage line structures.
- ▶ Ongoing investigation on the purchase of a 4x4 aerial platform truck for easy and safe working at heights.
- ▶ Ongoing investigation on the vegetation management to eliminate electrical network disturbances cause by trees.
- ▶ Ongoing investigation on infrastructure access road development to ensure easy access for effective maintenance.

## HV Cables Branch

The HV Cables Branch is responsible for the maintenance and operation of all 132 kV and 33 kV underground transmission cables, as well as all the 11 kV cables that form part of the primary network infrastructure.

The chart below is an illustration of the cable system types and circuit lengths that the branch is responsible for, as at the end of 2013/2014 financial year.



### Challenges

The maintenance of pressurised gas-filled and fluid-filled cables continues to be a problem, especially the gas-filled cables. However, major projects are under way to replace several unreliable cable circuits of this type in the near future. Some of these projects will see unreliable gas-filled cable circuits, namely, Mayville-Huntley's Hill 1&2 and Mayville-Sydenham 2&3 decommissioned within 2014/2015 financial year based on the commissioning of Randles Road and Ridgeview Substations. In 2013/2014 financial year, two of these gas-filled cable circuits were replaced with the reliable XLPE cable circuits. Although there is progress being made regarding these problematic cables, it will take some time before they are completely phased out of the network as the replacement is done in sections. The Branch is also investigating some short term solutions to efficiently maintain these cables and solve problems associated with these cables, such as bulk gas storage in order to reduce the frequency of gas re-filling, thus allowing Electricians to focus more on tactical maintenance.

### Highlights

- ▶ In 2013/2014, the Branch experienced no 132 kV cable faults. The Branch's drive, to focus more on tactical maintenance in order to prevent cable electrical faults before they occur, has proven fruitful. A contract is now in place to perform serving tests to confirm the integrity of the outer jacket of the cable hence preventing any degradation of the metal sheath and eventual failure of the cable.
- ▶ A generic maintenance contract is now in place that includes jointing and terminating, and other type of work that is frequently performed by the branch. This will assist in reducing the overdue maintenance and ensure that more focus is on tactical and preventive maintenance instead of non-tactical and reactive maintenance.

### Future Plans

In 2014/2015 the Branch is giving attention to researching and evaluating the diagnostic testing equipment for 33 kV and 132 kV cables. This is ongoing and benchmarked to international evaluations. Once the Branch has identified the technically and economically viable equipment, this will be budgeted for and purchased in order to undertake diagnostic testing of cables to reduce the risk of unplanned and costly outages. The Branch also intends purchasing the ready-to-use standby 132 kV cable links that will be used to bypass substation equipment during maintenance and/or repair operations, offering the continuity of supply to maintain end consumer satisfaction and avoid business losses.

## HV Network Control Branch

The High Voltage Network Control Branch comprises of 4 Divisions: HV Network Control, System Performance, Network Management and Control Systems.

The High Voltage Network Control Division is responsible for the safe operation and efficient performance of the HV network, which incorporates a 24-hour, manned HV Network Control Centre with remote control and alarm facilities. EThekwini Electricity's primary transmission network, being the supply from 275 000 V down to 6 600 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.

Network Management and Control Systems Divisions are responsible for the planning, operation, maintenance and reinforcement as determined necessary of the Unit's primary supply infrastructure. In addition, the Divisions are responsible for installing and maintaining systems that are required for the efficient monitoring and control of the Unit's critical infrastructure.

### Highlights

- ▶ As an integral part of Electricity operations, a Disaster Recovery Site has been constructed. This site will house all redundant equipment for mission critical systems and allow the Unit to maintain or quickly resume functionality in an event of a disaster at the current Control Centre.
- ▶ A legacy Remote Terminal Unit (RTU) replacement program is well underway. To date, 90 % have been substituted with state-of-the-art hardware featuring increased functionality and provision for electrical network expansion.
- ▶ The HV interconnected network model is developed. The model represents the HV network in an electronic format. This forms the basis for switching, power flow analysis and representation of the current network state
- ▶ The Branch has establishing a data exchange server to facilitate bi-directional real-time data transfer between SCADA platform and other applications within the organisation.
- ▶ The Branch has compiled and implemented standard work flows and processes. This document hierarchy consists of quality manuals, procedures, work instructions and records.

### New Technologies

- ▶ To improve quality of supply to customers, the Branch has commenced a drive to roll out remote master trip resets which will facilitate improved remote restoration of supply.

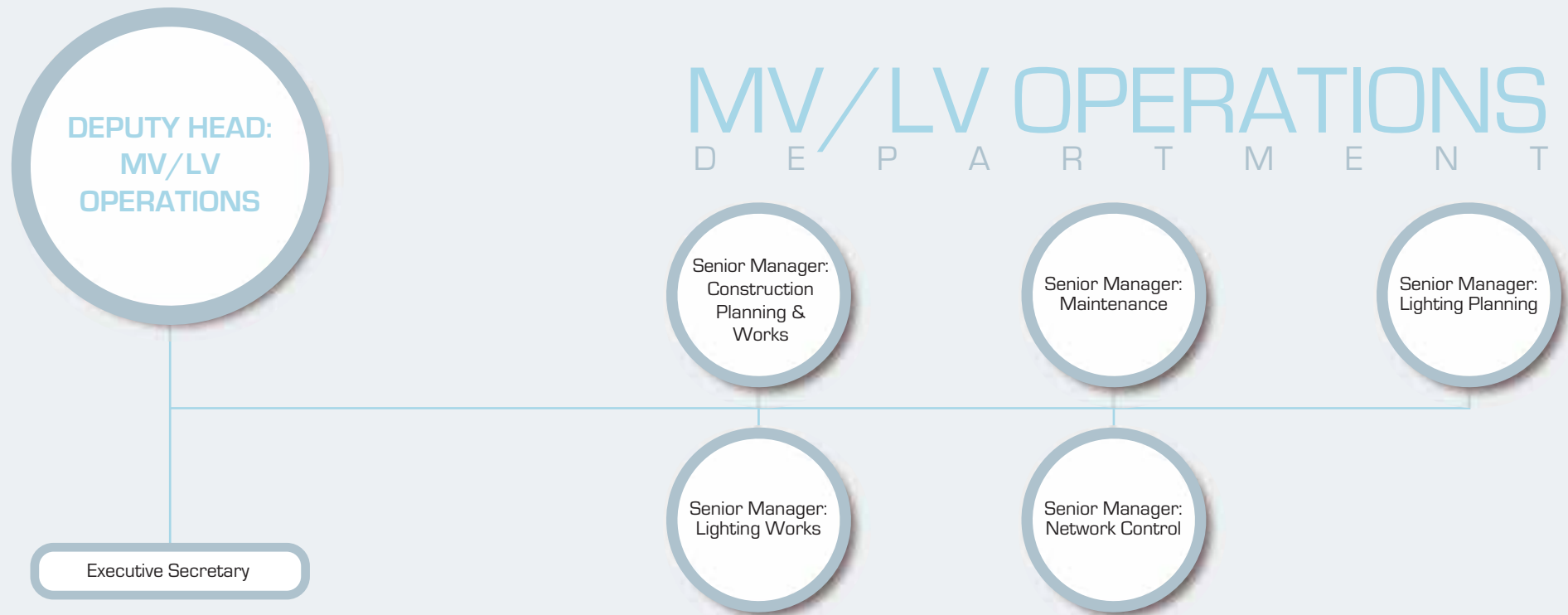
- ▶ The Branch is finalising the incorporation of Under Frequency Load Shedding (UFLS) into the Integrated Control and Protection (ICAP) system which will ensure eThekwini Electricity sheds the required amount of load during an under-frequency event to prevent a national black out.

### Challenges

- ▶ Staffing of the HV Control Centre continues to be a challenge given that Eskom and other municipalities compete for a very small pool of scarce skilled employees.
- ▶ EThekwini Electricity faces the same security challenges as other major electricity distribution organisations in South Africa. Substation theft is a growing concern, therefore the HV Network Control Branch are embarking on the following projects to combat theft:
  - ▶ An organisation level substation security policy is currently being developed and compiled.
  - ▶ A project to roll out Closed Circuit Television (CCTV) cameras is well underway. Twelve HV substations that have historically experience high theft rates are now equipped with CCTV surveillance. Through this project, the successful arrest and conviction of a thief has been achieved.
  - ▶ The non-lethal perimeter intrusion detection system contract features new designs based on Branch experience and security best practice. Through this contract 33 substations have been upgraded to feature the new design.

### Awards/Achievements

Renewable energy projects, contributing 1 000 MW of "green power" to the national electricity grid, passed grid code compliance assessment and have been operating commercially. These represent 20 projects from round one (970 MW in total) and 3 projects from round two (54 MW in total). HV Network Control Branch staff (representing the AMEU) together with Eskom and NERSA are part of the National Team responsible for this.



# MV/LV OPERATIONS

DEPARTMENT

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/street lighting and has a strategic focus of introducing new and improved energy efficient lighting technologies into the city. Further to the above roles, the department manages and controls all medium to low voltage substations.

Advancements in technology with the benefit of cost/operational optimisation is 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.

## Construction Planning & Works Branch

eThekwini Electricity continued to provide electricity to housing projects, transit facilities, informal settlements and rural areas. The grant received from the Department of Energy has assisted in electrifying 14 770 low income and informal dwellings so that at least another 60 000 people can enjoy a better life. 813 non-prepaid supplies were provided to other residential developments within the eThekwini municipal area.

### Highlights

This Branch spent 97 % of its operating budget of R130 million, and overspent the capital budget of R235 million by 14 %. Some of the major capital projects include:

- ▶ Supply to Cornubia Phase 1A and Cornubia Industrial
- ▶ Supply to Hammonds Farm Phase 1
- ▶ Laying of medium voltage circuits from the Kingsburgh 132/11 kV substation to Doonside substation
- ▶ Reinforcement of Klaarwater and St Wendolins
- ▶ Upgrading of services in the Island View area
- ▶ Replacement of ageing medium voltage switchboards

### Challenges

While we have managed to attract a few more employees; the Planning and Construction Branch still has a large number of its posts vacant. These positions include Electricians, Technicians, Engineers and Branch Heads. The Branch relies on the services of Consultants to process applications for new connections and manage the installation of service connections. Contractors have continued to complement our staff in implementing our infrastructure projects.

During the year there were 7 minor accidents and 4 disabling injuries within this Branch. The Branch also achieved a 4 star safety rating.

## Maintenance Branch

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 associated faults on the electrical distribution network within the municipal supply area. This Branch comprises of 6 regional works depots and a Maintenance Planning Division based at the Electricity Headquarters. The Branch consists of a Senior Manager, 7 Managers, Specialist Engineer, Engineers, Technicians, Electricians and the various levels of administration and assistant staff.

The maintenance of eThekwini Electricity's distribution network is vital in ensuring the integrity and reliability of supply to our large customer base. This Branch prides itself on high standards and strives to comply with various national standards and the Power Quality Charter in order to meet the requirements of customers.

### Highlights

- ▶ The Branch is in the process of researching various technologies that may assist with the extremely challenging conditions and the immense workload. Our Engineers are currently in the process of procuring cable and switchgear diagnostic equipment that will assist in the condition monitoring of these apparatus.
- ▶ The Branch has invested R1.8 million for 6 LV and service cables fault locators (surge generators, HD cables analyser and ground microphones amplifier) to improve service delivery

### Challenges

- ▶ The major challenge facing the Branch is the growing pandemic of theft of electrical infrastructure. In recent months, the magnitude of copper theft has been increasing and eThekwini Electricity's substations have been the victim of vandalism. The fundamentals of an electric circuit for distribution require a well defined electrical system with earth reference. The removal of this reference poses significant risk to eThekwini for a number of reasons (Health and Safety, Electrostatic and Lightning, Protection). As a result of the various vandalism problems associated with copper theft, the Branch is embarking on a pilot project to evaluate the performance of Copper Clad Steel (CCS), and in particular, discoloured CCS (Camouflage), as a suitable replacement of bare copper. Camouflage has the advantage that it is a bi-metallic material consisting of hard drawn steel which is metallurgically clad with 99.9% pure copper and has no scrap value. Due to copper theft on neutral cables; the Branch has also procured 2.4 km of 240 mm<sup>2</sup> AL LV cable for neutral connection and is currently being tested.
- ▶ Rapid growth of the electrical network coupled with the shortage in human resources and an increase in failures, has resulted in significant backlogs of planned and preventative maintenance work. The Branch has undertaken an aggressive recruitment drive, during the year under review to bolster its internal resources and reduce the reliance on external service providers. 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.
- ▶ The Branch has seen a significant increase in maintenance expenditure over the past few years. This figure has increased significantly, especially during the past 6 years and is now in excess of R400 million per annum. This increase in expenditure was mainly due to a considerate focus on fault rectification caused predominantly by ageing network, third party damage, theft of infrastructure, vandalism and the acquisition of external service providers which has resulted in reduced levels of workmanship. The co-operation of internal staff, consultants and contractors in delivering an acceptable level of service to our customers is vital in ensuring that this Branch meets its objective.
- ▶ While the Branch is rolling out the coverage of jumpers (with LDPE pipe) throughout the network in areas with high animal activities, reports on electrocution of animal/bird are still high. The Branch is investigating the use of covered conductors (CC) for overhead lines together with the installation of MV line bird diverters.

## Lighting Planning Branch

The Lighting Planning Branch is responsible for the planning, design, inspection and maintenance planning of the public lighting infrastructure for the eThekweni Municipality. This includes the planning and design of new lighting installations, upgrading of existing lighting infrastructure, research and investigation into new lighting technologies and bulk lamp replacements. A major responsibility of this Branch is the planning and design of capital projects. The annual capital budget for the financial year under review was R14.2 million and projects were planned for upgrades from conventional technologies to LED street lighting, major route improvements, new major routes, lighting of parks and sundry lighting.

There are currently approximately 187 000 streetlight installations, 49 cemeteries, 250 parks, 12 beaches, 17 subway lanes, 31 swimming pools and 93 stadia and sports fields for which the municipality is responsible and provides lighting for.

The Branch operates on an annual budget of approximately R25 million which include salaries, allowances, general expenses, repairs and maintenance. Repairs and maintenance accounts for 80 percent of this operating budget and this is further broken down into planned lighting maintenance, bulk lamp replacement and pole painting. The Branch also budgets for the maintenance and consumption charges for public lighting in areas supplied by Eskom.

### Highlights and Lowlights

- ▶ Currently various grant funding options are being evaluated for the installation of LED streetlights to replace the 80 Watts mercury vapour luminaires in residential areas, 150 Watts high pressure sodium (HPS) luminaires on secondary roads and 250 Watts high pressure sodium luminaires on main arterial roads. These funding option include EEDSM, Department of Energy, Swiss and German donor funding.
- ▶ A large number of the projects undertaken by the Branch involves interaction with other service units and external entities such as Roads Provision, Architectural Department, Parks, Leisure & Cemeteries, Roads and Stormwater, Strategic Projects, Tongaat Hulett's and a host of developers and external electrical consultants. The Branch plans and designs conventional and special lighting projects for these entities, and takes into account any specific requirements for each of them.
- ▶ Other major projects for the current and future financial years include; Bridge City to Pinetown on the Integrated Rapid Public Transport Network (IRPTN) route, Illovu Road (Kwamashu), Umgeni Road/N2 Interchange, completion of MR 577 (Kwadebeka), School Road (Verulam), M4 Ruth First Northern Freeway, Inanda Road (Waterfall) and floodlighting for ablution facilities in informal settlements. The lighting for all High Voltage (HV) substations is currently being audited and upgraded in a phased approach from HPS (orange light) to Metal Halide (white light) to cater for the requirements of CCTV cameras.
- ▶ The Branch continues to dedicate research and investigation into energy-efficient lighting solutions. Technology such as LED (Light Emitting Diode) lighting is being hailed as the future of lighting and is becoming increasingly present in the lighting environment. Consumers have shown a great appreciation of this "new" white light.

- ▶ In addition, the Branch is considering a telemanagement system of lighting control whereby lighting levels along major routes could be reduced by dimming for that part of the night where traffic volumes are minimal. These systems also have the facilities of added monitoring of lighting infrastructure which could significantly assist with the spiraling scourge of theft and vandalism.
- ▶ The Branch has achieved an acceptable staff compliment and we now aim to work on building their skills and experience within the Branch. The long-term goals are to initiate complete audits of all public lighting systems and undertake the necessary upgrades and improvements thereof.

## Lighting Works Branch

Lighting Works Branch is responsible for construction and maintenance of about 187 000 streetlights in the whole of the eThekweni Municipality area of supply. The Branch is constantly being challenged in dealing with theft related faults, which is forcing the Branch to come up with innovative ways and means to minimising theft.

### Highlights and Lowlights

- ▶ The Branch bid farewell to a electrician and welcomed 3 new pre-competent electricians. The Branch highlight was the successful training of staff in compliance with operational requirements such as OHM competency, safety related training.
- ▶ The Branch achieved an overall 3 star NOSA rating during this financial year due to an IOD which were investigated. A corrective measure was put in place to ensure the safety of all employees.
- ▶ The set target of 70 % turnaround time on faults/complaints received and attended to within 5 working days is still a priority in ensuring service delivery to the municipality supported by the currently running maintenance and construction contract E 9103.
- ▶ The Lighting Works Branch managed to work within the allocated funds without compromising the service delivery to the customers.

## Network Control Branch

The reliability of our electrical network is vitally important as disruptions in the supply leads to economic losses, lost productivity and negatively impacts public health and safety. The Network Control Branch closely monitors network performance and manages incidents on a 24 hour basis. We play an important role in providing sustainable solutions to ensure the security, stability and continuity of supply to eThekweni Municipality's area of supply. Our dedicated team are responsible for operation and maintenance of the electrical network and in the event of a system disruption, we must respond appropriately and promptly to facilitate the coordination of the grid and customer load restoration.

The various contributing factors to power outages include theft on our network, inclement weather conditions and defective equipment. For the period under review the following faults were attended to;

Type of Fault	Number of incidents
Individual Faults	217 765
LV Faults	8 067
MV Faults	4 645
Total	230 477

We believe in promoting technological development to improve operational efficiencies. The evolution of the Smart Grid has the potential to remotely manage assets, perform detailed load prediction and minimise outage durations by effectively deploying resources.

### Achievements

- ▶ The Advanced Distribution Management System (ADMS) solution has been adapted in recent months to include technological advancements in software and in order to adhere to eThekwinini's requirements. The solution, which will more efficiently support outage restoration activities, outage identification, management and notification, provides insights into possible avenues for process improvement. Our key project activities in the year ahead will be to combine all of the features required to enable data integration and interoperability between different business systems and to train our staff on this product.
- ▶ The Distribution Automation (DA) project is another endeavor to enhancing the quality of life for our customers by the reliability and quality of service we provide. This entails the procurement of suitably intelligent medium voltage devices, remote terminal units (RTUs) and wireless modems, master station configuration and on-site commissioning. This allows the much needed remote visibility and control to maintain our electrical network. Thus far 517 substations have had additional wiring and alterations carried out in order to ensure functionality of the RTU's. The RTU's have been installed and commissioned in 367 distributor substations. The status of these sites is regularly monitored to ensure communication to the intelligent devices, however security remains a challenge. We are currently looking at solutions to incorporate access control at all substations.
- ▶ We take pride in providing dedicated teams and standby staff at special events such as Elections, Conventions, Festivals and Sport Tournaments. Our staff works behind the scenes to ensure a stable power supply and backup power in the event of a power disruption.

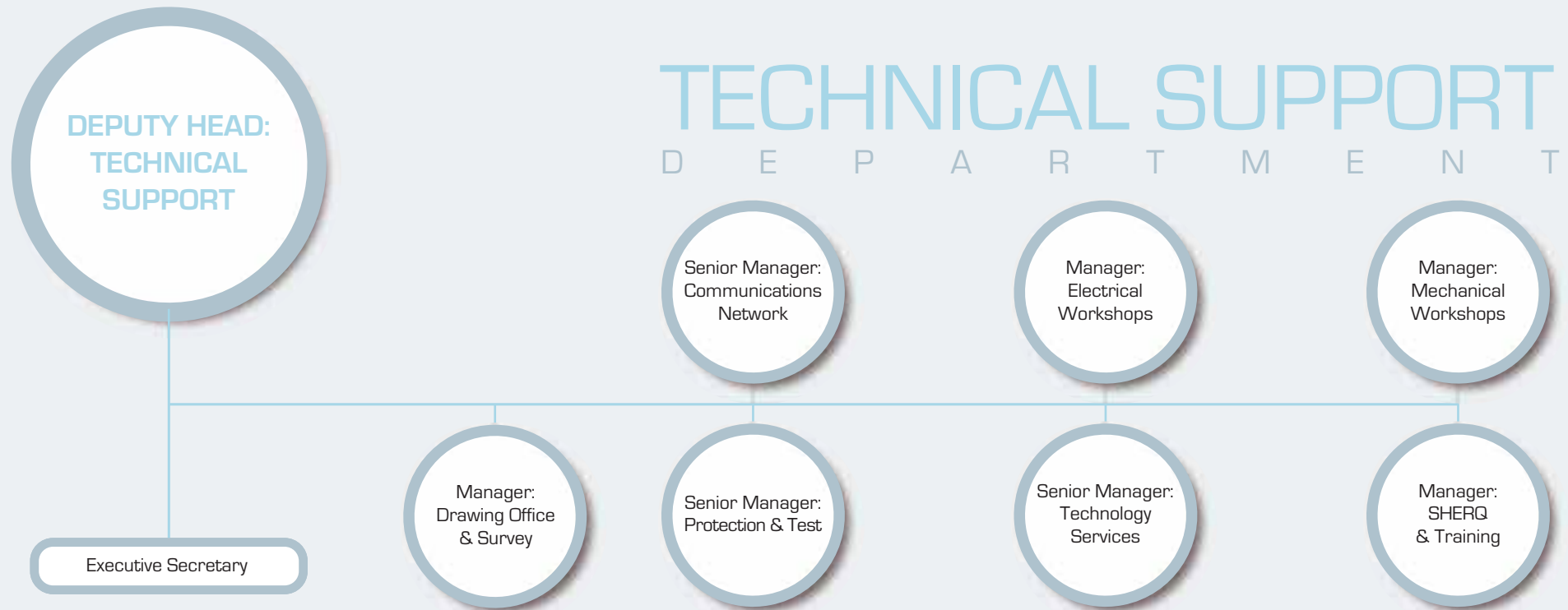
### Challenges

Vandalism and theft on the electrical network are a growing concern as it results in delays in service delivery to our consumers. One of the main threats is that of copper conductor theft and it is estimated to be in excess of R 5 billion a year around various municipalities within the country.

We currently assist the SAPS to identify cable at the scene of thefts and report all cases of cable theft to the SAPS when they are discovered while attending to faults.

### Future Plans

In the year ahead we aim to improve operational efficiency and customer satisfaction by utilising a combination of improved business processes, specialised software solutions and skilled staff.



Provides a diverse range of technical services to support the unit

The Technical Support Department provides a diverse range of specialist services within the Electricity Unit. These services contribute towards the Vision of the Unit, which is to be a leader in electricity distribution providing energy for the future. The Department comprises of seven Branches, that ensure resources are effectively and efficiently utilised so that value is added to the 723 593 customers that the Electricity Unit supplies. The Technical Support Department goals are set to achieve continuous improvement in all its operations.

## Communication Networks Branch

The Communication Networks Branch is responsible to provide and maintain 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

- ▶ Planning, installation and commissioning of new fibre optic, data, wireless and copper pilot communication network links for new substations/other sites utilising Transmission & Regional Planning/Projects/Consultants and Communication Networks/Contractors to enable the commissioning of Supervisory Control and Data Acquisition (SCADA), Protection, Security, Telephone, IT and City systems by set deadlines.
- ▶ Acquisition, installation and commissioning of customised dust proof equipment/termination panels, ruggedised carrier class DWDM and SDH access multiplexers, optical switches/routers/media converters, GPRS cellular radio modems, Voice Over Internet Protocol (VOIP) adaptors and Etherpads/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 within set time periods without backlogs developing. Maintenance and repair of all communication links and system equipment within set time periods without backlogs developing to ensure continuous reliable operation of critical user systems.

### Highlights

- ▶ Filling of critical posts within the Branch with competent staff.
- ▶ Implementation of a SIM management system to assist with the management of excessive data usage on SIMs.
- ▶ Successful implementation of a redundant last mile link to the Cellular Services provider as a backup to the corporate APN.
- ▶ Documenting of Codes of practices including fault procedure and user manuals, configuration guides and commissioning sheets.

### New and exciting projects undertaken

Powerline communication on copper pilot cables pilot project in the Sunningdale supply area A Pilot project was carried out at Sunningdale major substation to four of its feeder distributor substations. The objective was to get reliable TCP/IP connectivity to these sites via our pilot copper cables. A new technology to run communications over power lines known as Broadband over Power Line (BPL) was tested.

This technology would allow us to roll out a fixed medium communications network to some of our distributor substations and offer services for SCADA, CCTV, access control and remote access. From the results of the project, BPL technology will be adopted in the future into Communication Networks strategy. Communication Network Engineering is arranging further testing over 11kV cables.

Micro-duct and micro-fibre cable pilot project in the New Germany Supply area Expansion of eThekweni Electricity's fibre optic network down to the distributor substation level requires sustainable technology that is cost-effective, offers capacity for future expansion and allows for rapid deployment. Traditional cabling technologies allow for expansion in network capacity only up to a certain extent, if more capacity is required, new cable ducts must be installed which can be very expensive. The use of a single 7-way multi-duct tube (Figure 1) allow for future expansion of the network without incurring any civil engineering costs (trenching). Installation of micro-fibre optic cable of up to 72 cores each, using compressed air significantly reduces the installation time. This also allows for greater installation distances (up to 1 km) without the need for joints or manholes.

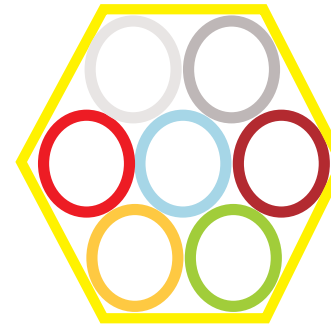


Figure 1: 7-way multi-duct

The merits of the technology were assessed by conducting a pilot project that linked two Major substations and three Distributor substations according to the installation philosophy (Figure 2). Successful completion of the proof of concept (POC) pilot and adoption of the technology going forward required the development of codes of practice (COP) and recurring contracts for the supply of materials to be put in place. A tender document was compiled for a two year reoccurring contract for the supply delivery and offloading of micro-duct tubes, micro-fibre optic fibre cable and various accessories to support the installation of this technology.



This involved taking recommendations from the POC project and specifying all the necessary line items for the successful completion of future projects according to the COP.

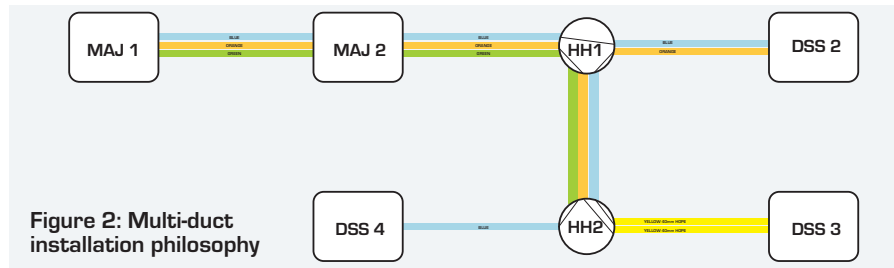


Figure 2: Multi-duct installation philosophy

### Future Plans

- Development of a Smart Grid Strategy in line with eThekweni Municipality's long term Smart City requirements.
- Provide a private, integrated tier 2 communication network solution for Distribution Automation and other Smart Grid applications.
- Implementation of a formal Work Planning and Control cycle within Communication Networks.
- Implementation of a sustainable maintenance plan for the Pilot Network to support MV cable differential protection.

## 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 utilised 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

- Conduct 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.
- Carry out 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. Upon job completion by contractors or electricity staff, all scrap cable is returned for disposal and respective proceeds are received.

### Highlights

- Due to the aging test equipment used to analyse autorecloser operation, a new improved mobile primary injection test set was purchased. This improved the efficiency of test results on the field and within the Electrical workshop.
- Development of standard operating procedures for the automated Test Bay facility.
- Developed new procedures for the refurbishment of transformers to reduce the failure rate prior to being reinstated to service.

### New and exciting projects undertaken

- Research and development of an oil test laboratory to produce results on transformer diagnostics.
- The implementation of an efficient insulating oil supply and return process for the various Branches within Electricity to prevent theft of insulating oil.

### Future Plans

- The establishment of an oil Test Laboratory within the Electrical Workshop Branch to carry out routine testing of insulating oil from re-generation plant and to extend this service to both HV and MV/LV Branches.
- Creation of an electronic database for condition monitoring of power transformers based on oil test results. This will assist in preventative maintenance of transformer.

## 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 galvanised 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.
- ▶ Maintaining of ISO 9001 accreditation by ensuring successful audits.
- ▶ Practical training of Mechanical Apprentices.

### Highlights

- ▶ The rehabilitation of ageing machinery.
- ▶ Improvement of ergonomics of workshop layout.
- ▶ The ongoing maintenance of ISO 9001 accreditation.

### Future Plans

- ▶ The mass manufacturing of “A” type bracket for the project to connect electricity to informal settlement households.

## Network Drawing Office and Survey Branch

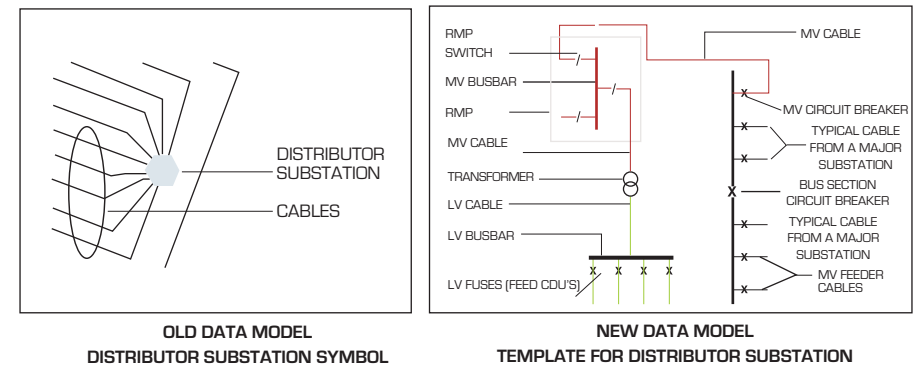
The Network Drawing Office and Survey Branch comprises of six Divisions, namely Administration, Network Records, Geographic Information Systems (GIS), Special Projects, Utility Plans and Survey. The main focus of the Branch is to maintain an accurate record of all Underground and Overhead electrical assets and provide an efficient GIS to support the many other enterprise systems within the Electricity Unit.

### Routine Activities

- ▶ The Administration provides an administrative service to the Network Drawing Office and, a printing and scanning service, to the Electricity Unit.
- ▶ The Special Projects Division updates and maintains the Low Voltage Circuit Diagram Database and makes these diagrams available via a web browser. It also updates the code of practice, drawings and illustrations, for the Technology Services Branch.
- ▶ The Survey Division provides a survey function to internal and external customers.
- ▶ The Network Records Division is responsible for the capture and update of the Underground and Overhead Electrical Network, in the GIS.
- ▶ The GIS Division ensures that there is data integrity in the Network Records Database and makes this data available via the ArcGIS Server browser. This Division also provides GIS support services to all staff of the Electricity Unit.
- ▶ The Utility Plans Division attends to all way leaves, provides network information to visitors and responds to all written correspondence received by the Network Drawing Office Branch.

### New and exciting projects undertaken

- ▶ The Survey Division provided a detailed survey for Informal Settlements and Transit Camps, to assist the Unit to achieve its target of electrifying 14 000 prepaid Customers.
- ▶ The Network Records Division investigated and modelled missing underground assets in the GIS dataset, to assist the Asset Management Field Capture Project, to deliver a completed network model.
- ▶ The existing GIS data model was redesigned to host the network data that was collected in the Asset Management Field Capture Project.
- ▶ A geometric network in the GIS to provide a connected data model was designed.



- ▶ ArcGIS desktop software to MV/LV Planning and Construction, Customer Services, and Lighting Planning and Construction was rolled-out, to expedite the export data from GIS to CAD.
- A tool in GIS that populates a Property Key that is captured against all new applications was developed. This tool is also used to populate Property Keys for the data that was captured in the Revenue Protection Meter Sweep Project.
- GIS data to upload to navigating devices was customised, to assist with the location assets in the field.

### Future Plans

- ▶ Survey of Informal Settlements and Transit Camps to achieve electrification of 30 000 new consumers in 2014/2015.
- ▶ Investigate and model missing underground and overhead assets in the GIS dataset that were not captured in the Asset Management Field Capture Project.
- ▶ Procure of additional GIS software to effectively create, manage and disseminate network utility data.
- ▶ Provide a platform for the ArcGIS to successfully integrate with the other enterprise systems in the Unit.

## Protection and Test Branch

The Protection and Test Branch comprises of 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 maloperation. 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 maloperations.
- ▶ 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 and Lowlights

- ▶ Good progress was made with the Branch's DC upgrade programme, in which aged and failure prone DC equipment at 25 transmission sites and 30 battery distributor sites were replaced during the year ensuring a continuous and more reliable dc supply at these sites.
- ▶ The Branch made significant progress in addressing the relay maintenance backlog at transmission substations despite operating with staff shortages and many pre-competent staff.
- ▶ Relay failures on newly commissioned transmission circuits plague the Branch this year causing outages to customers and leaving the Branch committing resources as well as large amounts of time and effort in conjunction with the relevant relay manufacturers to investigate the source of the failures.

### New and exciting projects undertaken

- ▶ The Branch embarked on a protection settings audit during the year to ensure that the settings and relay configuration at all our transmission setting are optimised to provide proper discrimination as well as fast and accurate fault determination and fault clearance.
- ▶ The Branch also embarked on audit of the DC systems at our transmission systems to ensure that all DC loads are correctly wired and labelled to facilitate troubleshooting and the safe isolation of control equipment. During the year 36 substations were audited.

### Future Plans

- ▶ Addressing the numerous new relay failures that have occurred and identifying solutions with the relevant manufacturers to ensure that these modes of failure are eliminated.

## Technology Services Branch

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 eThekweni Electricity staff and contractors.

The Branch has continued its active participation in NRS projects as well as participating in SANS working groups where, in conjunction with work group members from other municipalities, Eskom, mines and major suppliers, specifications and guidelines have been prepared to promote uniform requirements for equipment and design methods for use in distribution systems.

### Highlights and Lowlights

- ▶ In keeping with eThekweni Electricity's Smart Grid initiative, all new mini substations are equipped with an electronic intelligent device for the measurement of the secondary voltage, currents, power and any associated maximum demand values. It is also equipped with inputs to signal in the event of an earth fault on the medium voltage cable network. All this information will be transmitted via a modem for remote monitoring back to the SCADA network to ensure quicker restoration times for faults.
- ▶ EThekweni Electricity has experienced high theft of steel trench covers (chequer plate) from substations, which poses a safety hazard. Technology Services therefore investigated the use of alternative materials. Resin concrete proved to be suitable for the application. It is light weight (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.
- ▶ Completion of the Underground Mains Code of Practice (UGM CoP). This is the second of the three series CoP to be completed.

### **New and exciting projects undertaken**

- ▶ **Introduction of Conti-suits to replace overalls:** In a bid to prevent serious injury caused by arc flash incidents, eThekweni Electricity has standardised on arc rated and flame retardant overalls that would replace the conventional overalls used by relevant staff. There has been in-depth research undertaken into the materials and testing of these overalls so that the risk of injury is mitigated to an extent. The overalls has an assigned Arc Thermal Performance Value (ATPV) of 12,3 cal. The ATPV is the incident energy value that must be exceeded in order to cause a second degree burn and is a function of distance from arc, fault level, protection operating times.
- ▶ **Supply Chain Management Workshop:** A workshop was conducted together with SCM staff to share knowledge on developing technical specifications and adjudicating tenders.
- ▶ **Information Sharing:** Lunchtime viewing of informative DVD's at eThekweni Electricity Library e.g. with the subject on Customer focus in order to fulfil the key component of the democratic developmental state which is disciplined, people - centred and professional public service.

### **Future Plans**

- ▶ Improved quality control at stores when goods are being received. This will ensure that all items are inspected by Technology Services staff prior to being issued out.
- ▶ Technology Services has been mandated to assist all Branches within the Electricity Unit with the development of new specifications. This will place added pressure for the staff within the Branch to become more familiar with assets and processes of other branches.
- ▶ The Electricity Unit is plagued by outages as a result of theft of various items that have scrap value. The Branch will continue to investigate technologies that have little or no scrap value or that can help alarm the Unit when these items are been stolen.

## **SHERQ & Training Branch**

The SHERQ and Training Branch is responsible for the design, implementation and monitoring of systems to ensure compliance with the Occupational Health and Safety Act and associated Regulations throughout the Electricity Unit.

### **Routine Activities**

- ▶ Conducting risk assessments, conducting safety audits, conducting environmental audits, provision of standby personnel, operational training/competency accreditation of all persons engaged in construction and maintenance, and investigation into machinery-related incidents and the introduction of measures to prevent recurrences.
- ▶ The Branch assists +/- 50 Line Managers to comply with Town Clerk Chapter 25, Construction Regulations, comply with Codes of Practice, undertake accident investigation (Root cause analysis) and support to GMR 2.1's at safety investigations.

- ▶ Safety Officers conduct on-job observations and draws up deviation sheets that is sent to the relevant line manager to assist line managers operate and create a safe and healthy work environment resulting in fewer accidents.
- ▶ On the training side System Operations Senior Training Officers, Technical Training Officers and ICT Trainers ensures that the staff across the Unit is competent, committed and suitably qualified staff to operate and maintain the electrical assets on the network.
- ▶ Systems Operations Training provides artisans with knowledge to operate electrical equipment safely, thus eliminating damage to equipment, injury to staff or fatalities.
- ▶ Technical Training ensures the transfer of critical technical skills to staff thus ensuring an acceptable level of quality with regards to workmanship, installation and maintenance of plant and equipment. This also ensures that work is conducted in accordance with specifications and codes of practices as laid out by equipment manufacturers and the Electricity Unit.
- ▶ ICT Training equips eThekweni Electricity staff and contractors on the units IT systems.

### **Highlights**

- ▶ Architectural plans for construction of the new training facility have progressed well.
- ▶ Staff from the Branch is active participants at the National Core Working Group for Electrician Qualification, and the National Core Working Group for Switching Authorisation. These Work Groups are responsible for compiling the curriculum and implement training programs for National Occupational Qualification.
- ▶ The training centre was reassessed and re-accredited for assessment of Electricians.
- ▶ Pilot safety Demerit System to address safety violations by Contractors, in order to promote safety among Contractors was implemented.

### **Future Plans**

- ▶ Building extension of a new training centre that will be fully equipped with state of the art facilities.
- ▶ Registration of Training Officers as Moderators and Trade Test Officials with SETA.
- ▶ Attracting suitably qualified Training Officers still remains to be the biggest challenge for the Branch and will be focussed on the coming year.

### **Achievements and Awards**

- ▶ The eThekweni Electricity Training Centre building was recognised by KwaZulu-Natal's architects as one of the Top 31 buildings in the city for its unique design during the International Union of Architects World Congress.

# CUSTOMER & RETAIL SERVICES DEPARTMENT



Provides a customer contact and general retail service function for the unit

The Customer & Retail Services Department provides a customer contact and retail services function for the Electricity Unit.

The Customer & Retail Services Department consists of more than 400 employees and performs a diverse range of functions for the Electricity Unit.

## Pricing and Marketing Branch

The Electricity Pricing & Marketing Branch has several primary functions namely:

- ▶ To raise awareness about key issues involving electricity
- ▶ To provide a technical and admin 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. Technical and non-technical loss management still remains one of the top agenda's for the Branch.

## Marketing Division

The Marketing Division is continuously holds interactive events with communities to raise awareness and promote the ideals of the department to provide electricity to all households. The knowledge of reducing energy consumption through good behaviour and technology is being promoted by the marketing staff. To better communicate and educate the community, several pamphlets were designed and distributed to the community. The activities of the Marketing Division create a platform to engage with the public to address the following:

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

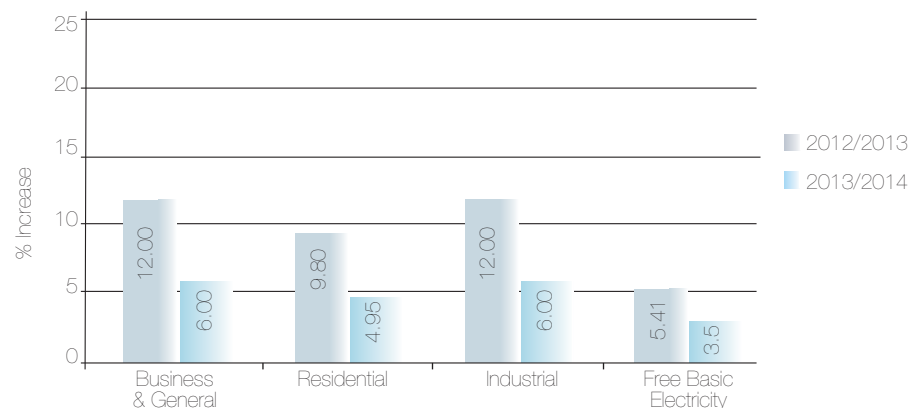
## Highlights

The Marketing Division has been working closely with communities and the internal planning staff to facilitate the process of electrifying areas that are without electricity. There are numerous challenges to overcome before all the eThekweni citizens are electrified however the Division is committed to play its role in making this a reality in the coming years. The table below is a summary of positive results from informal settlements electrification project.

PROJECT STATUS	No. of HOUSEHOLDS
PROJECT COMPLETED	Applications Received
Informal Settlements	5 314
Transit Camps	4 422
PROJECT UNDER CONSTRUCTION	Applications Received
Informal Settlements	5 652
Transit Camps	1 327
PROJECT WITH PLANNING FOR DESIGN	Anticipated Connections
Informal Settlements	28 429
Transit Camps	2 399
INFORMAL SETTLEMENTS UNDER INVESTIGATION PRIORITISATION	Estimated number of connections
Informal Settlements / Transit Camps	125 282

## Pricing Division

The Pricing Division designs electricity tariffs and provides tariff advice to key customers. Tariffs are designed to be cost-effective whilst ensuring accurate cost recovery and reflectivity. The overall average tariff increase as approved by NERSA for 13/14 financial year was 8 % however individual customer categories were increased as per the figure below



Tariff design is proving to be a major challenge in the midst of the huge increases from Eskom and we are finding it more difficult to design cost reflective tariffs that are affordable to the end customers. Major emphasis has been placed on protecting the indigent poor to ensure that they are not adversely affected by the huge increases. The tariff increases is calculated in line with NERSA's guideline methodology.

Table below compares the Average Percentage Increase of the electricity tariff in 2013/14 fiscal year with other Metros.

City	Average Percentage Increase
Cape Town	7.86 %
eThekweni	5.50 %
Johannesburg	7.41%
Tswane	8.00 %

## Highlights

- ▶ Pricing did not introduce Inclining Block Tariffs (IBT). In eThekweni, implementation of IBT would negatively impact Poor and Low income Households where more than one family lives on a property.
- ▶ The Branch was capable of charging Free Basic Electricity at NERSA's recommended guidelines.
- ▶ New Industrial Time of Use Notified Maximum Demand Rules was approved by NERSA and will be implemented on the 1st of the new financial year.

### Future Plans:

- ▶ Lack of knowledge about FBE remains a concern in the department and new key strategies will be investigated to increase our FBE customer band for the 14/15 financial year.
- ▶ Due to the drive for "Green" Electricity the need is arising for the Division to implement Embedded Generation tariffs for residential customers. A tariff has been designed and submitted to NERSA for approval.

## Contact Centre Branch

The Contact Centre provides a one-stop faults reporting service, theft reporting, capturing of meter readings and gives assistance in the use of prepaid meters, vouchers and other administration enquiries for the benefit of eThekweni Electricity's service delivery and therefore attaining information with the aid of upgraded systems to provide our customers with correct and reliable feedback.

### Highlights

- ▶ We have managed to reduce the average of the longest call waiting period from 2 minutes to less than 20 seconds, which means that our consumers are now being assisted quicker.
- ▶ We have increased our footprint by introducing email/SMS and other media as part of how consumers can communicate with the Contact Centre. We received and attended to about 30 000 email, and about 25 000 SMS queries in the last fiscal year, it has also proven to be a popular choice of communication. We have also attended to Facebook and Twitter queries.
- ▶ All Contact Centre staff members were taken for a field trip, which was both fun and very educational. It was to get the team onto the street to "touch and feel" various electricity equipment as part of training so they can be better equipped to assist consumers. This proved to be very successful and as a result we experienced a significantly reduced number of proven customer complaints and also started getting written and verbal compliments from our consumers.
- ▶ We have procured a fully multimedia contact centre solution. With the new systems, we do not foresee many challenges. We have also seen a more positive relationship between Contact Centre, Consumers and our other internal departments such as Depot and Control Centre promising to get even better in the next fiscal year.

### Achievements

Mlungisi Nkwanyana received an award for "Best Customer Service".

## Meter Engineering Branch

The core responsibility of the Meter Engineering Branch is to ensure all metering equipment used for billing purposes are appropriately specified, tested, installed and maintained. To ensure these objectives are undertaken efficiently, the Branch is sub divided into four specialised Divisions. These Divisions are Advanced Metering & Projects, Metering Workshop, Whole Current Metering (Construction and Maintenance), and the Bulk Metering.

### Advanced Metering and Projects Division

This Division is fundamentally accountable for the acquisition, specification and commissioning of new metering technologies. During the past year, this Division has been involved in the improvement of automated meter reading systems communication equipment to facilitate reduction of manual reads. These systems make use of cellular wireless technology via GSM for the remote acquisition of metering data back to the master stations for billing purposes. Updated GPRS/RF wireless technologies are currently being investigated as possible alternative means of wireless communication. These later technologies can positively add to the Division as it is a more cost-effective and reliable alternative for future application.

Another important project currently being undertaken by the Division is the implementation of smart metering for both residential and industrial use. The most recent advancement to this has been the appointment of Smart Metering Management Consultants. This team of experienced professionals will work closely with the municipality's management and look into the various solutions of integrating the concept seamlessly into the municipality's structure. The Division is also continuously working with ESKOM on multiple load control projects to ensure a healthy national grid during times of high demand. The advanced metering Division also has been given the sole responsibility of programming all electronic meters for every tariff application.

### Bulk Metering Division

The Bulk Metering Division is responsible for all new applications and upgrades for the metering of large power users. This involves complex meter installations and maintenance. The Division is directly responsible for the generation of metering data and maintenance of nearly 1 000 of our largest customers which makes up around 50 % of the total revenue generated by the electricity department. In addition, the Division undertakes planning, forecasting and more importantly execution of load profile requests for tariff analysis purposes for our business customers who would like to migrate to more favourable tariffs.

The Division is also responsible for the migration of summation systems to the multi-feeder systems, thereby improving accuracy of metering and ensuring precise revenue collection is being continued. The Division is also responsible for the scheduled meter replacements and changes. This includes replacing all electromechanical and outdated electronic bulk meters with the later version electronic bulk meters.

## Whole Current Metering Division

The Whole Current Metering Division is further divided into maintenance and construction in order to optimise turnaround time due to a significantly larger consumer base. This section is fundamentally responsible for all new metering applications, upgrades, reinstates, credit to prepaid changeover of small businesses, commercial and sectional title residential customers. Rectification of onsite faults and queries on all complex metering installations also forms a significant part of the section's responsibilities.

## Workshop Division

The principal function of this Division is to test, repair and calibrate all single phase and three phase electro-mechanical meters. The Division is also required to carry out testing and servicing of prepayment, three phase and single phase electronic meters. Further to the above duties the Division provides critical support for equipment quality assurance by sample testing 10 % of all new meters purchased.

This Division has an approximate average throughput of 400 single phase, 200 three phase and 1 300 prepayment meters per month and is striving to meet the growing and changing market demands and to minimise capital expenditure. The workshop is housed in large premises and geared to cope with high volumes of meter tests and calibrations. There will be significant upgrades in the near future with the possible acquisition and installation of new and advanced meter testing equipment. Quality systems are constantly being enhanced to improve and maintain highest levels of efficiency and accuracy.

## Challenges

- ▶ The filling of technical posts continues to be a hurdle for the current year and the year to come.
- ▶ A restructure of the Meter Engineering Branch will be considered and priority will given for motivation and training of staff.

## Customer Services Branch

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

## Highlights

### Restructuring of Meter Reading

It is intended to increase the number of posts for meter readers to cope with the 10- and 30 day check meter readings after disconnection in order to ensure that the Revenue Protection's disconnection process is not compromised by unlawful reconnections.

The restructure of meter reading will provide improved supervision of meter readers and is expected to provide a more efficient service to customers.

## Accommodation

Due to space constraints, Northern Region Offices were required to relocate. Rental premises have been found at 15 Twilight Avenue, Umhlanga and the centre is due to open its doors on 1st October 2014.

## New Applications

The ongoing provision of "RDP" Housing 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. Regular monthly meetings are being held with Housing to meet the increased demands to meet targets.

## New and Exiting Technologies and Projects

### SMS technology

This has been developed to capture meter readings by consumers via cell phones.

### Web Page Design

This is being investigated to capture online applications, account queries, meter reading capture, token purchases and compliance information to be displayed.

### Northern Customer Service Centre Displays

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

## Challenges

### RMS (Revenue Management System)

The "RMS System" is still being perfected before launch and senior Customer Services administration staff is assisting with this to ensure that Electricity's concerns are addressed. There have been delays in the RMS project in the 2013/2014 financial year. The Customer Services Branch is bracing itself for final testing and intense training to ensure a smooth transition from COINS to RMS. Temporary agency staff has been employed for the short term to assist customers at counters during the training and bedding in of the new system, which should be completed in this new financial year. Due to delays temporary staff is being employed in permanent positions in other departments and new staff has to be trained.

### Queuing System and Customer Flow Management System

There is a definite need for this system to be installed in all customer service areas. Currently we are investigating the local market, such as systems at SARS.



## 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 minimise these losses. The pillars of successful revenue protection; People, Processes and Technology, need to be integrated into a Revenue Protection Strategy.

The following projects or technologies are implemented by eThekweni Municipality to enhance Revenue Protection.

- ▶ Installation of Prepayment Meters (Split).
- ▶ Meter Management and Operation System.
- ▶ Digital Pen & Paper Technology.
- ▶ Protective Structures.
- ▶ Audit of Business Customers.

These projects contributed in the success of eThekweni Electricity's efforts in keeping total losses well below the national and international benchmarks.

### Installation of Prepayment Meters

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. We strategically targeted poor customers who are struggling to pay for their services to install prepayment meters, the majority of them are exempted to pay rates and their water consumption are low, as a result, they pay very little for Water or they don't pay at all due to the 6 kilolitres free that they qualify for. So, it make sense to encourage these customer to install prepayment meters due to the following advantages for a prepayment metering system:

- ▶ Can budget for the cost of the usage of electricity;
- ▶ Can purchase electricity for as little as R5; there are no shocking bills at the end of the month; you use only what you can afford, and pay for it in advance, your meter indicates which appliances use a lot of electricity, your meter indicates the credit you have left in your meter;
- ▶ When your electricity runs out, your meter switches off automatically. Thus, you will not incur any debt by using electricity for which you have no money for, as with the credit meters;
- ▶ Also there will not be any reconnection fees, penalties and interest charges, as there will not be any arrears; etc.

### Split Prepayment Meters that uses Power Line Carrier (PLC) Technology

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 Customer Interface Units (CIU) is achieved via existing mains cables. This means that when you need to retrofit conventional meters that were installed using cables without a dedicated communications cable, there is no need to retrofit house service mains with communications cable. These meters communicate using advanced Power Line Carrier technology, which is widely used throughout the world as a method of communication for home automation systems. 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 meter that uses power line carrier (PLC) technology in some areas.

### Remote Access Solution

In addition to the benefits of split prepayment metering, it offers two way communications, improved revenue protection and fraud detection of the prepayment meters with benefits such as:

- Fraud notifications (e.g. tamper condition)
- Auditing the prepayment meter remotely
- Interrogate individual meter registers
- Graphical display of consumption patterns
- Power failure notifications from the mini-sub
- Check metering to determine non-technical losses
- Reports on low consumption
- Two way communication with the prepayment meter - send maintenance tokens to the meter

### Remote Access Terminal (RAT)

- ▶ The RAT is a three phase PLC Data concentrator
- ▶ Is able to monitor the PLC meter communications between the meter and its Customer Interface Unit
- ▶ Real Time Clock (RTC) functionality
  - For date and time stamped (Meter and RAT) events
  - For storage of 30 minute profile date
  - Implementing scheduled actions (such as data upload)
- ▶ Configured events are uploaded as they occur
- ▶ Meter data is uploaded according to time table
- ▶ Enables two way communications with Landis+Gyr's PLC2 prepayment meter

### Meter Management and Operation System

EThekweni invested in a structured Revenue Protection Branch with 3 regional offices and field teams reporting to each office. They are focusing on reducing losses over the entire meter base, but the inherited challenges faced with the prepayment system made it difficult to get "ahead of the game". The following was required to address this challenge:

- ▶ One Central Master System that reconciled all records
- ▶ A structured field audit with the aim of normalising all prepayment and as well as residential credit meter records
- ▶ An integrated Work Order system to manage all follow up field operations and record updates
- ▶ Data Reporting and Data mining to plan and execute a pro-active Revenue Protection program

With more than 358 000 prepayment 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 and to identify each meter position with an accurate GPS coordinate. The audit teams would first finish the work in a small designated area before the second action was initiated. This follow up action was to address all required remedial field work identified by the initial audit. These operations were executed by a separate specialised normalisation team. The advantages of this approach included:

- ▶ The audit team could focus on the data acquisition and their productivity was optimised.
- ▶ There is a negative impact with limited access when tamper disconnections are started. By first completing the audit sweep the access rate was much higher.
- ▶ Fraud was limited since there is no imputes to bribe the audit team not to report anomalies. The audit team had no direct contact with the normalisation team.
- ▶ The normalisation team's skill set was selected towards the remedial tasks to be performed. An electrician's time was not wasted by being held back by the overhead of a full data audit. We embarked on a program to normalise our prepayment data set and in parallel launched a paperless works order system to follow up on all remedial tasks identified through this project. We are now in the position to run an intelligent revenue protection program based on back office analysis and targeted inspections. The positive results are already evident and the future returns should be even greater. The success of the operation can be measure by having the correct building blocks in place comprising:
  - ▶ People - A project can only be effective with committed and dedicated resources.
  - ▶ Processes - The correct processes and procedures established at the start of the project are essential.
  - ▶ Technology - This is the last element, but it is only effective once the first two pillars are in place. Investing in technology on its own will not ensure success.

#### Protective Structures

In some instances Meter Room doors (Steel) are vandalised. As a result, customers were continuously tampering with electricity meters and illegally or dangerously connecting cables onto our electricity supply network.

In areas where vandalism is rife we decided to install Vandal Proof Meter Room Doors or Protective Structures with an electronic locking system. These Structures are designed with external hinges and an internal locking system. The design is such that with the hinges removed the door cannot be opened.

- ▶ Asset Protection to ensure minimal energy losses (non-technical).
- ▶ To prevent unauthorised access and damage.
- ▶ Enclosure has a high security features.
- ▶ It can be monitored and controlled remotely.

#### Security: Electronics

- ▶ Communication via GPRS to control
- ▶ Separate locking system for LV and MV doors
- ▶ All entries are logged
- ▶ Monitor alarms remotely
- ▶ RFID key tags for access
- ▶ Optional (Only 1):
  - Heat sensors to detect a cutting torch
  - A daylight sensor - indicate any access
  - Vibration sensor to detect drilling

#### Audit of Business Customers (CT Driven Installations)

The annual financial losses to energy suppliers caused by connection errors in meter installations are not to be neglected. There are many possibilities in making incorrect connections during installation. In many cases, installation faults are rarely discovered at the time of billing and, sometimes, not recognised for many years. This results in considerable losses to energy suppliers.

In the energy market the meaning of correct energy billing becomes even more important, especially because more parties are involved in this process.

It is imperative that utilities provide the necessary training to the Revenue Protection and Meter Engineering staff, set out procedures for the re-commissioning and verification of measurement and metering equipment and to provide the standard tools and test equipment required by technicians to perform their tasks to ensure that the required safety and/or quality standards are practised.

The policy that defines the criteria regarding planned maintenance on electricity metering and measurement equipment needs to be adopted to ensure that utilities comply with NRS 057 and the Electricity Metering Code of Practice.

Revenue Protection Division conduct annual audits to verify measurement and metering equipment and analyse the circuit faults found during the verification.



Provides guidance and human resource support to employees and the unit

The Human Resource Department is responsible for providing guidance and support to the employees of eThekweni Electricity Unit. HR Staff are involved in addressing issues which impact Human Resource management for the Unit as a whole, through coordination of policy issues and involvement in labor relations activities.

## Human Resources Services and Administration Branch

This Branch provides a service to the staff of the eThekweni Electricity Department in the field of Talent Management and Acquisition, Industrial Relations, Employee Welfare and Pay Administration.

### Highlights

- ▶ The Branch introduced eCareers to the Unit. eCareers, allows jobseekers to search and apply for vacancies online. This will improve application processing and handling as the technology is adopted by all jobseekers.

### Challenges

- ▶ Even with the successful launch of eCareers; the majority of the jobseekers are still manually submitting applications due to the lack of internet access. It was also observed that while applications did use eCareers they would also submit a hardcopy to ensure their application was received. This causes additional work to staff as an application can be processed multiple times.
- ▶ EThekweni Electricity saw a decrease of 31 staff in its overall staff compliment. This decrease is mainly due to the Technical Staff being offered better packages in the Private Sector. New Non-Technical Staff recruited helped boost the total posts filled to 2 286 out of 3 750 posts.

	TECHNICAL	NON TECHNICAL
Management (Grades 14 +)	105	8
Skilled Labour (Grades 4 - 13)	802	1 323
Unskilled Labour (Grades 1 - 3)	0	6
Trainees	42	0
<b>Total staff</b>	<b>949</b>	<b>1 337</b>
<b>Vacancies</b>	<b>263</b>	<b>1 201</b>

### Future Plans

The HR Business strategy going forward will be to improve the turnaround time for recruitment and industrial relation matters. To ensure a healthy and productive workforce by targeting wellness and performance issues that is negatively affecting the staff.



Ensures that legislative practices, controls, policies and procedures are adhered to

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 eThekweni 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 throughout, 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 Regulators (NERSA) has stringent requirements pertaining to reporting as a ring-fenced Business Unit. NERSA's Framework for Economic Regulation is complex and is presenting significant compliance challenges going forward.

## Administration and Transport Branch

The Administration Branch covers 3 key areas of the Electricity Service Unit, viz Administration, Fleet and Buildings.

### Admin Division

The Administration Division is responsible for various administrative functions, such as,

- ▶ Document Management, within the parameters of an approved Governmental Archival System, in terms of the Archival Act
- ▶ Word Processing of letters, reports, contract documents, transcribing of meetings and disciplinaries/enquiries
- ▶ Telephone Management System
- ▶ Travel Arrangements
- ▶ Micro-filming of electricity application forms
- ▶ Mail Delivery Services

### Fleet Division

The Fleet Division is responsible for the acquisitions, maintenance, and disposal of vehicles, and plant/equipment. The Current Fleet size is 1 400, made up of Cranes, Aerial Platforms, Various Trucks, Bakkies, Cars, Generators, Trailers and Compressors. The majority of the fleet are specially modified to create mobile workshops, which best suit the operational work activities undertaken by staff.

Challenges are experienced when there are changes in legislation, new technology and/or vehicle availability. Standardisation and improved vehicle design has greatly improved vehicle availability. Retraining of Drivers is required regularly due to changes in technology/operation of vehicles.

### Building Maintenance Division

The Building Maintenance Division is responsible for general building maintenance/repairs, security, and the upkeep of the grounds.

The provision of office accommodation and parking areas is a major challenge. Various interventions are being implemented viz acquisition of buildings, restructuring of existing office space, leasing of office space, and erection of new buildings.

## Information and Communication Technology Branch

The 2013/2014 has been a busy and challenging year for the ICT Branch. The number of new initiatives, including 2 new Electricity office sites, Sizakela Centres and the continuation of the upgrade of eThekweni Electricity's enterprise asset management system, have kept all resources in ICT fully utilised. Key internal focus areas for the Branch in this period however, was to continue to capacitate the Branch with new resources and skills, and improve on our processes and procedures to minimise the reliance on long term contracted skilled resources. There has been some progress in the recruitment plan, in that a number of key posts have been filled, namely the Data Centre Operations Manager, ICT Security Officer, 3 x Systems Engineers and an Application Analyst (whom unfortunately has since sought employment elsewhere), whilst numerous key posts in ICT are in an advanced stage of recruitment. The non-appointments in the outstanding posts can largely be attributed to unavailability of suitably qualified and experienced applicants, resulting in the re-advertising of these posts repeatedly.

### Facilities Division

The role of this Division within ICT is to ensure that there is no disruption of critical systems and to oversee data centre operations, physical security, facility management, hardware and equipment maintenance, administration of servers, database infrastructure.

As our Information Systems are being implemented and updated on an ongoing basis, the infrastructure on which these systems rely, require constant upgrade or complete metamorphosis in alignment with best practices and the COBIT framework for good ICT governance. The upgrade of eThekweni Electricity's Enterprise Asset Management System (Ellipse 8) at eThekweni Electricity, with its new system architecture, required significant investment in new hardware and software, and due to unforeseen circumstances has unfortunately seen a significant delay and is now expected to go live in March of 2015.

The Division still suffers from human resource constraints however, the appointment of the Data Centre Operations Manager post has stabilised this Division. It will be a key focus and deliverable for the Data Centre Operations Manager to expedite the filling of the vacant posts in this Division and progress is being made. The completion of the new DR Site building in Westville and the subsequent Data Centre infrastructure procurement and implementation is in progress, and will improve the security and availability of our business systems.

Continued improvements in the governance of ICT at Electricity have been achieved with ongoing improvements being made in Change Control Processes and the monitoring and management of system changes. Corporate IS now known as IMU (Information Management Unit) together with Electricity Unit, is developing a Corporate Governance of ICT Framework as required by the DPSA and adopted by Cabinet on 21 November 2012. This significant initiative will require a number of changes in the roles and responsibilities of ICT and capacity building will be required to achieve the DPSA's required implementation plan.

### Development Division

Although we subscribe to the principles of implementing Best Of Breed packaged solutions, there will always be a need for some bespoke software development, particularly in the very specialised area of Software Integration and Data Interchange. It is therefore important for the Development Division to build capacity to enable the achievement of our ICT Strategy.

Software development has largely been outsourced, and the appointment of an Application Analyst enabled progress to be made in the sourcing of some systems development. Unfortunately the loss of this resource has resulted in severe challenges in the achievement of the objectives of this Division however the recruitment of the Manager Development is close to finalisation, and we are confident that this appointment will enable an improvement in Electricity's capacity in the development area.

### Support Division

The good progress made in the recruitment of ICT Support Officer's in 2011/2012 has resulted in continued improvements in the quality of service to the end user. The formalising of the Support portfolio of services and the documenting and improvement of the processes in Support continues and has resulted in improvement in the maturity against the control objectives set out in COBIT for ICT Services Management. The upgrade to Windows 7 is progressing well with minor issues being reported and resolved.

### Network Division

The year has been extremely busy with the extension of the Data Network to 2 additional office sites which required extensive network infrastructure implementation. The rollout included IPT, CCTV and Access Control for both sites which accommodated the Finance, SCM, Productivity and Business Risk Divisions as well as a new Customer Services site at Gateway in Umhlanga. The implementation of Solar Winds for monitoring and management of the network resulted in improvements in the quality of service and availability of the network. The upgrade of all edge switches and core switches being completed has enabled better management and improved the availability, security and performance of the network. The extension and increased usage of both Vodacom and MTN APN's (Access Point Name) has increased the administrative management burden on the limited human resources in the Networking Division.

### Prepayment Division

There was continued growth in the number of Prepayment Customers to over 358 000, has resulted in growth in the number of transactions averaging almost R3 million a month, with an estimated value of sales averaging over R80 million per month. Two key customer service improvement initiatives were implemented; this being, the use of the Electricity Call Centre for the logging of Prepayment Vendor Related faults and stationery requests.

The Roll Out of our Vending Infrastructure to approximately 20 Regional Customer Service Centres, will undoubtedly improve the service we provide to our Vendors and Customers.

### Finance Branch

The Finance Branch is responsible for the financial control over all activities of the Unit. 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 Unit's annual and medium term budgets, annual financial statements and monthly management reports are prepared by the Finance Branch.

The Branch also monitors compliance with statutory and internal regulations. In addition the annual financial statements for the 2013/2014 year and the multiyear budgets for the 2014/2015 year onwards were prepared and approved within the stipulated deadlines.

During the year under review, the Finance Branch contributed to several projects in the Department, namely, the Outage Management System (OMS), the Revenue Management System (RMS) and the Asset Management System (AMS). Phase Two of the AMS implementation which relates to MV/LV is now at the advanced stage and is expected to be completed in the last quarter of the 2014/2015 financial year.

Finance is also playing an active role in the implementation and roll out of Ellipse 8 system implementation which is expected to go live by the end of the 2014/2015 financial year.

The Regulatory Reporting Manuals (RRM) project required by the National Energy Regulator of South Africa (NERSA) is 90% complete. Final review or adjustments are awaited from the Regulator, with the project expected to be finalised by September 2014. With the audit and successful completion of the 2013/2014 Annual Financial Statements completion, Management would like to recognise the dedication and enthusiasm displayed by the staff.

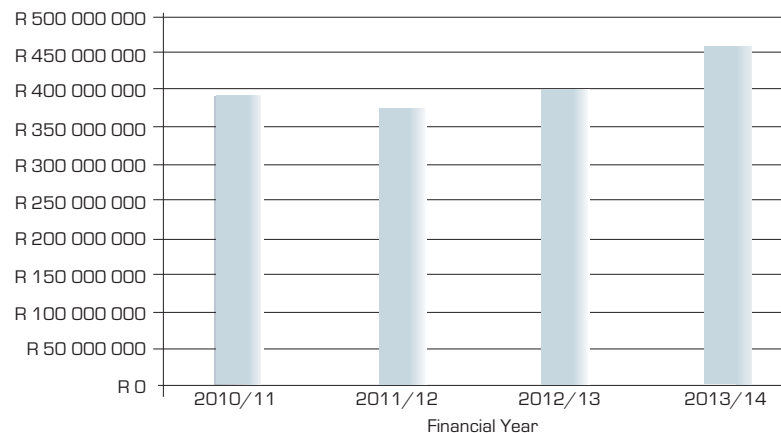
### Supply Chain Management Branch

#### Purchasing Division

The overall procurement usage value (goods and services combined) for the 2013/14 financial year increased to R458 404 829 which is a 13.81 % increase from the previous year. In 2013/14 financial year, despite a significant increase in the procurement volume of goods, the stock out of critical items remains a big challenge that affect the level of service delivery rendered by the unit.

	2010/11 year	2011/12 year	2012/13 year	2013/14 year
Usage Amount	R 392 698 339	R 379 038 138	R 402 771 215	R 458 404 829
Percentage Growth		-3.48 %	6.26 %	13.81 %

### Overall Procurement Usage



### Purchase Order Stats for July 2013 TO June 2014

Order Group	Order Type	No of Orders	Values of Orders
Contract	Stock Purchase Orders	2 908	R 397 489 497.55
Contract	Service Purchase Orders	1 813	R 6 739 339 112.93
Contract	Non Stock Purchase Orders	108	R 9 828 725.65
Non - Contract	Stock Purchase Orders	1 941	R 28 025 554.98
Non - Contract	Service Purchase Orders	7 445	R 437 245 705.41
Non - Contract	No Stock Purchase Orders	2 819	R 28 764 940.55

### Contracts Administration Division

The bulk of contracts were secured through competitive bidding process, award ratio demonstrates that the city is successful in achieving on its core procurement objectives of conducting a competitive and open process while maximising the value for money in the acquisition of goods and services. All contract awards are posted on the municipality's website. The contracts administration section administered 93 contracts, 68 were for the supply of services & goods and 25 were labour contracts. Only 5 appeals were received from the Appeals Committee and were successfully dealt with.

### Stores Division

Stores 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 all direct (outside) purchases.

#### Highlights

- New Stores truck purchased that will further improve service delivery.
- More staff members from Stores were able to attend self enrichment courses this year, which will hopefully increase their skills and productivity. This includes Health and Safety courses that helps prevent accidents and IOD's.
- Scanning systems were introduced at Meter Stores to capture individual meters' details. This allows for easier tracking of meters and provides more quality information to energy control.
- New computer systems were installed on each floor of Main warehouse stores. This has improved service delivery and stock control, where storekeepers on each floor can review stock levels and perform random stock counts.

#### Low lights

- IOD's went up from previous financial year.

#### Future Plans

- The continual improvement of our customer service levels at Stores.
- To train and empower more staff members, in order to improve productivity & skills.
- To acquire more reliable vehicles/equipment example, a new forklift for Stores.

### 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 contractor 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 Unit the 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. Below are the average working efficiencies for the various sections recorded for the past twelve months.

In-house Maintenance	In-house Construction	Contractors Maintenance
114 %	108 %	99 %



By creating documented overviews of all the business processes within the Unit we can identify improvement priorities and ensure that business processes meet both the user and the business requirements and that the best business practices are effectively managed.

#### Highlights

- ▶ A request from the ICT department to assist with the mapping and modelling of their business processes was received in July. To date some 18 processes have been mapped and captured on VIBE.
- ▶ Adapt IT are currently busy with the Ellipse upgrade and have also requested Productivity to assist with the mapping of the business processes.

#### Lowlights

- ▶ Shortage of staff trained in Business Process Management still remains a challenge. Staff have been identified to attend training.

## Business Risk Control Branch

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

### The Risk and Compliance Management Division

The Risk and Compliance Management Division is responsible for the formal identification, evaluation and mitigation of risks within eThekweni Electricity. Compliance to procedures and policies is assessed for the different Departments within the Unit to improve controls by generating appropriate solutions to solve problems or 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 Infrastructure Theft Investigation Division

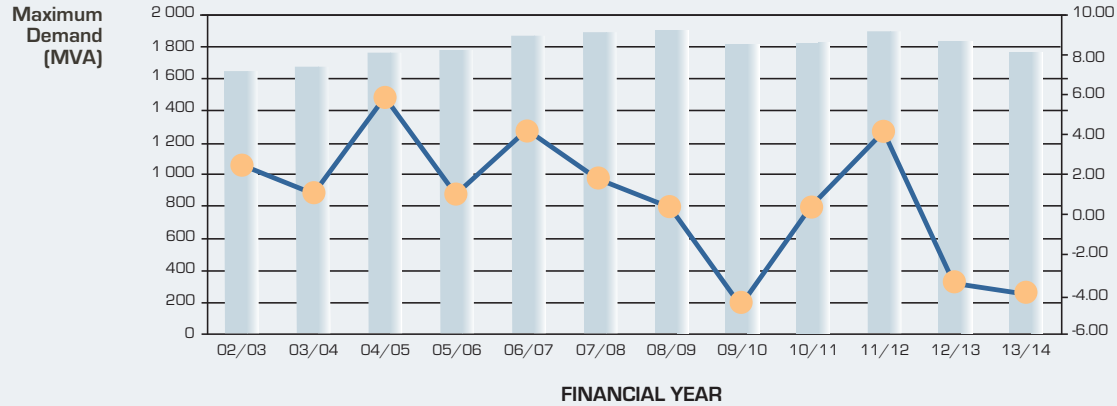
The Infrastructure Theft Investigation Division is responsible for the identification, investigation and mitigation of infrastructure theft on eThekweni Electricity's reticulation network and electrical infrastructure.

Cable theft and theft from substations have spiraled during the 2013/ 2014 financial year. Special operations were planned in hot spot areas with the assistance of SAPS. A special focus has been on scrap dealer operations in terms of the "Second Hands Goods Act" resulting in scrap dealers being charged and arrested. This Division has also established a relationship with the National Prosecuting Authority (NPA) to assist in the investigation and prosecution of syndicates.

As part of Non Ferrous Metals Crime Combating Committee, driven by SAPS where we engage with other stakeholders, our aim is to be one of the drivers in convincing law makers into adopting an earnest approach to incidents of copper theft in the ensuing year. Should this be successful, we envisage that harsher sentences would be handed down to perpetrators found guilty of copper theft. Our focus on awareness campaigns will continue, where we campaign in the eThekweni area educating communities and other Law Enforcement Departments regarding the impact of copper theft to the economy and also partnering with them in preventing the theft thereof.

It is also our aim to conduct an early identification process of the Unit's future potential risks with a view to alerting management timeously to ensure that sufficient time is available for the development and implementation of mitigating strategies. We will support management in their drive to adopt a Zero Tolerance approach to maladministration within the organisation. Hence, we will continue to pursue investigations and recommend action we deem necessary and considered to be in the best interests of the Electricity Unit.

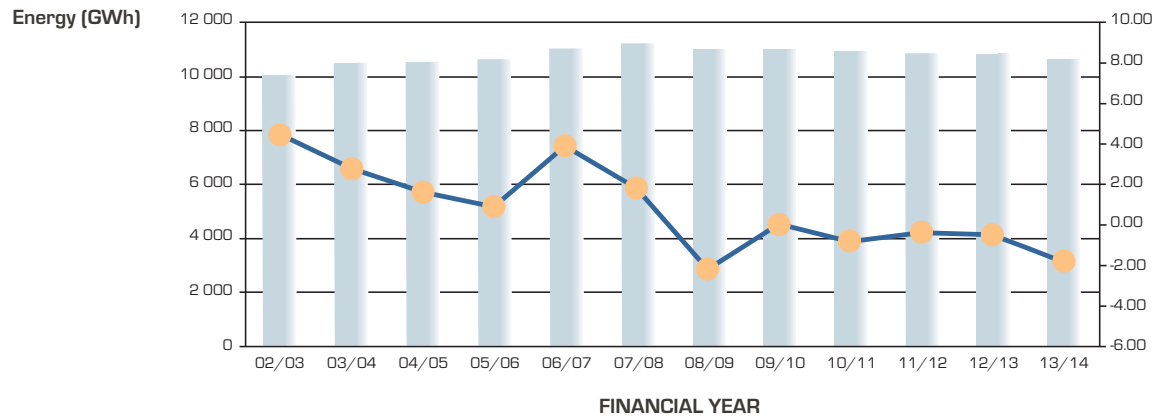
# Graphs



## SYSTEM MAXIMUM DEMAND

Maximum Demand (MVA)    % Growth

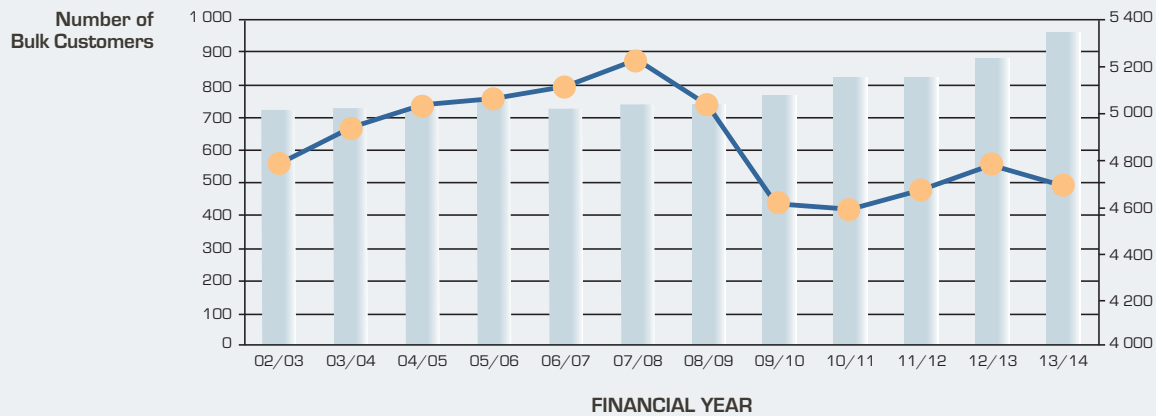
% Growth



## ENERGY SALES PER ANNUM

Energy Sold (GWh)    % Growth

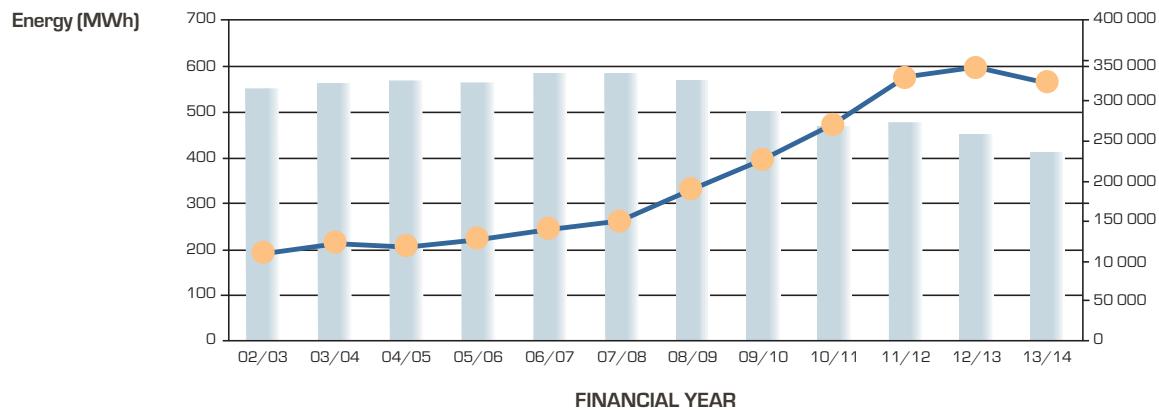
% Growth



## GROWTH OF BULK CUSTOMERS

Number of Bulk Customers ■ Energy Sold (GWh) ●

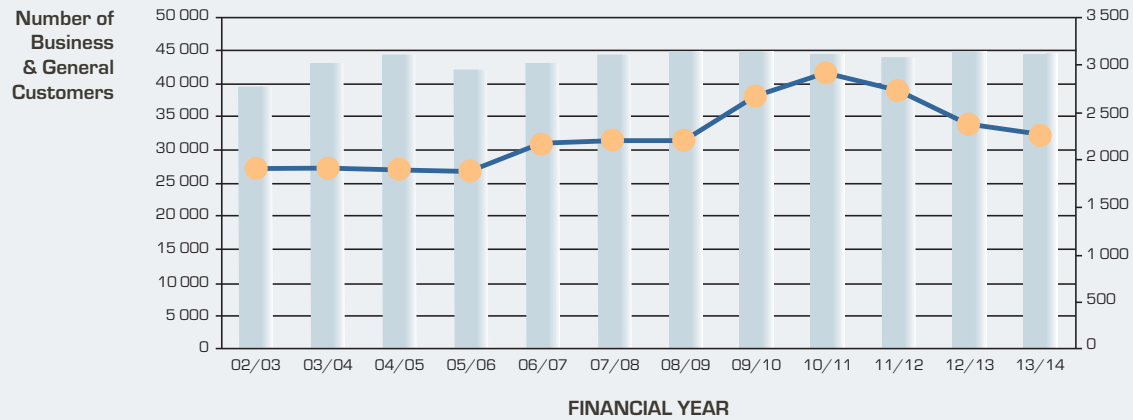
Energy (GWh)



## AVERAGE MWh PER BULK CUSTOMER/MONTH

Average MWh / Bulk Customer / Month ■ Average Income (R) / Bulk Customer / Month ●

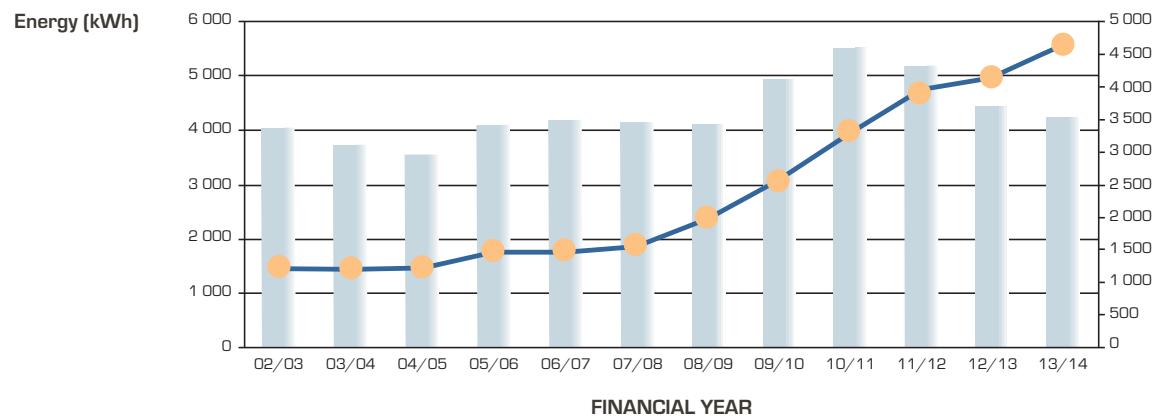
Rand (R)



## GROWTH OF BUSINESS & GENERAL CUSTOMERS

Number of B&G Customers ■ Energy Sold (GWh) ●

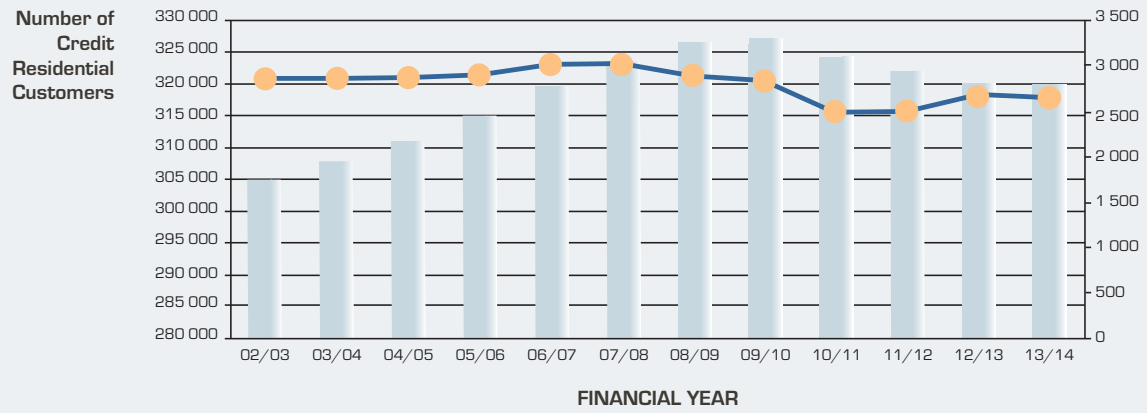
Energy (GWh)



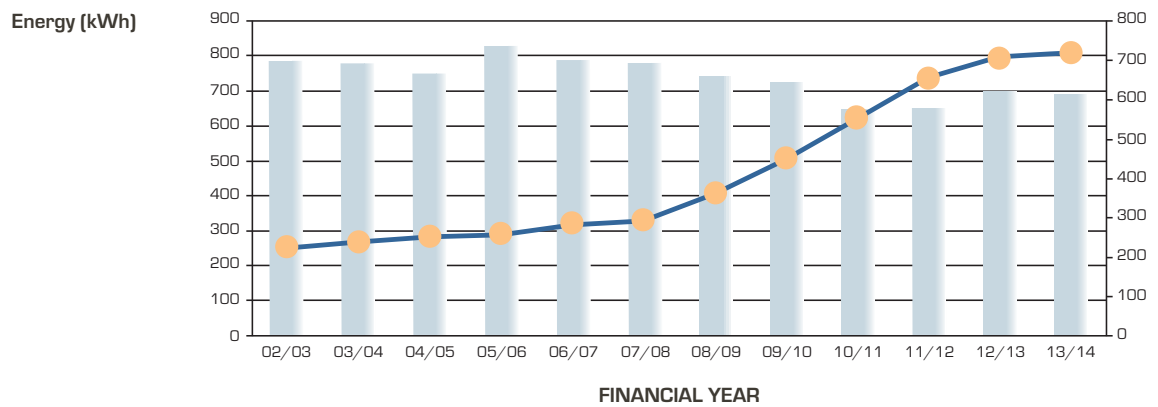
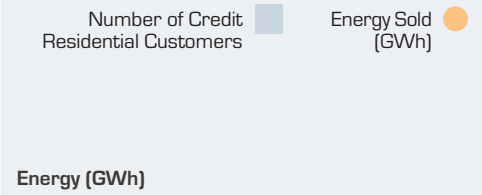
## AVERAGE kWh PER BUSINESS & GENERAL CUSTOMER/MONTH

Average kWh / B&G Customer / Month ■ Average Income (R) / B&G Customer / Month ●

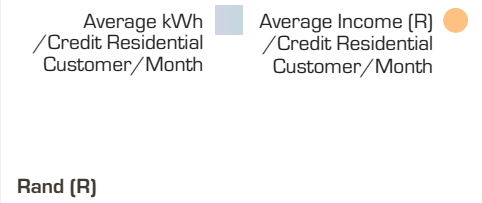
Rand (R)

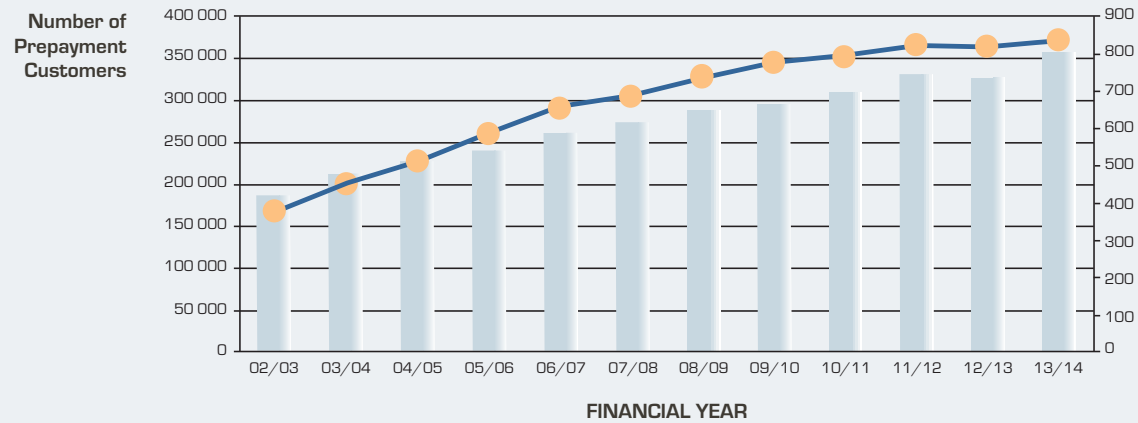


## GROWTH OF CREDIT RESIDENTIAL CUSTOMERS



## AVERAGE kWh PER CREDIT RESIDENTIAL CUSTOMER/MONTH

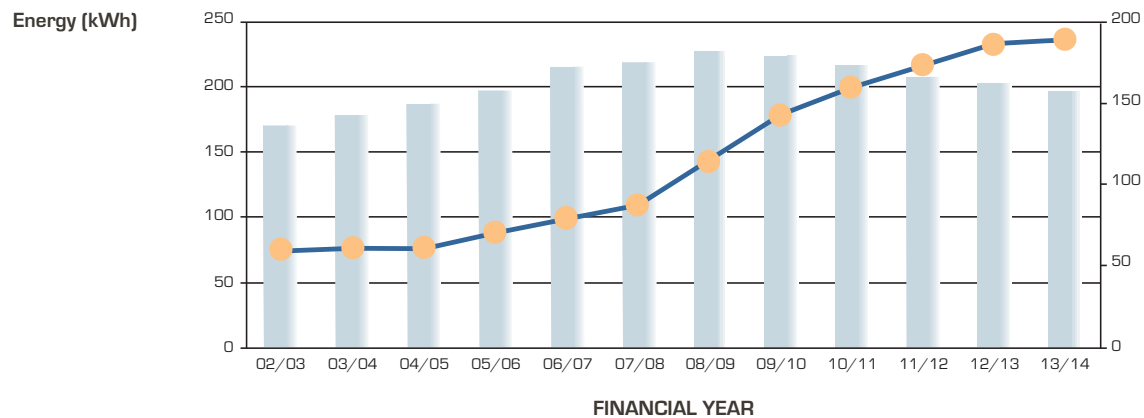




## GROWTH OF PREPAYMENT CUSTOMERS

Number of Prepayment Customers Energy Sold (GWh)

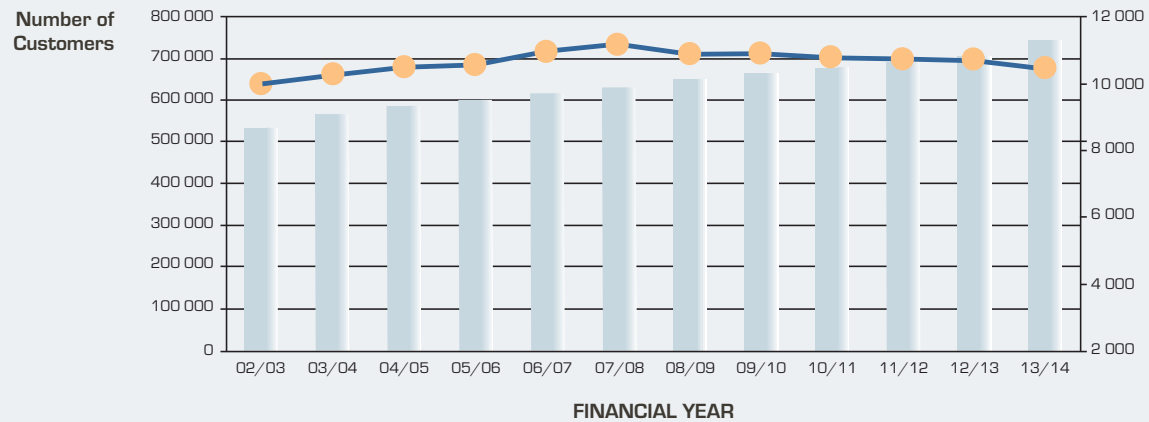
Energy (GWh)



## AVERAGE kWh PER PREPAYMENT CUSTOMER/MONTH

Average kWh / Credit Prepayment Customer / Month Average Income (R) / Prepayment Customer / Month

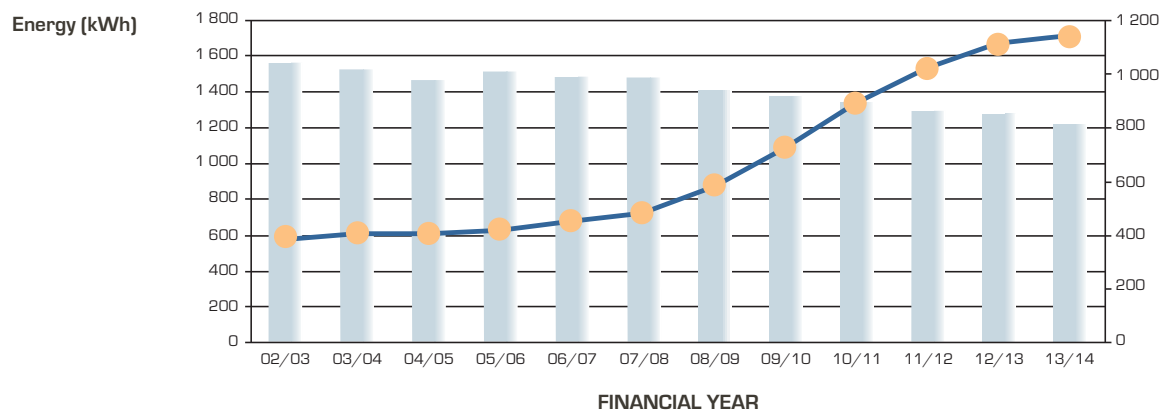
Rand (R)



## OVERALL GROWTH OF CUSTOMERS

Number of Customers ■ Energy Sold (GWh) ●

Energy (GWh)

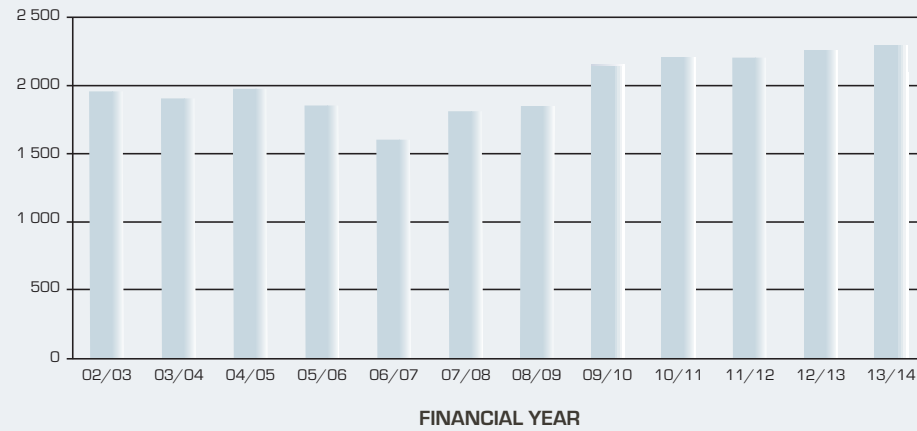


## OVERALL AVERAGE kWh PER CUSTOMER/MONTH

Overall Average kWh / Customer / Month ■ Average Income (R) / Customer / Month ●

Rand (R)

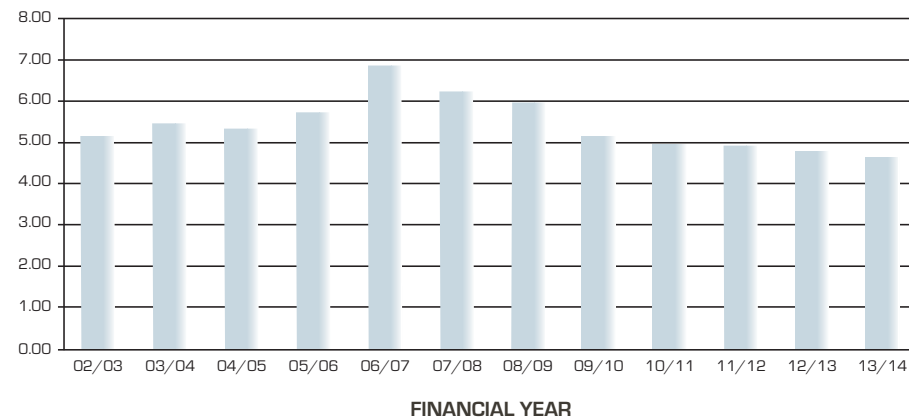
Number of Employees



## GROWTH OF EMPLOYEES

Number of Employees

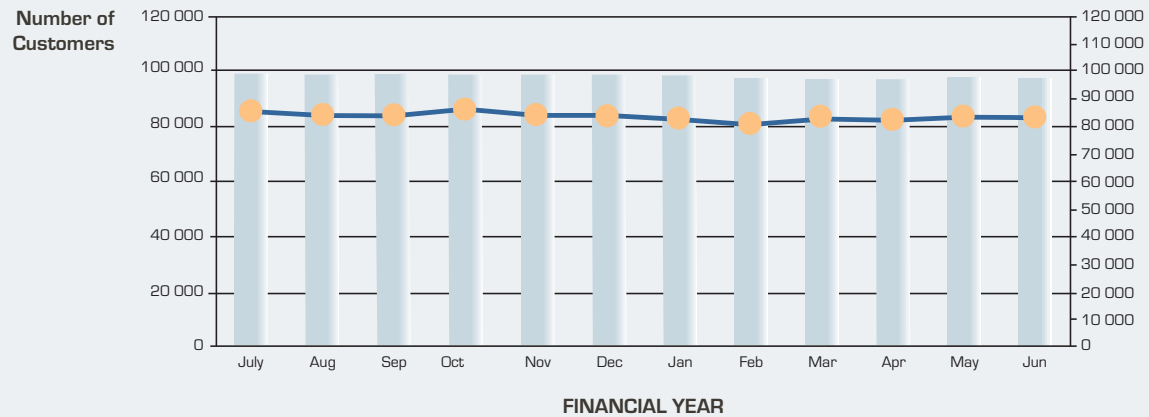
Energy (GWh)



## ENERGY SOLD PER EMPLOYEE

Energy Sold Per Employee (GWh)

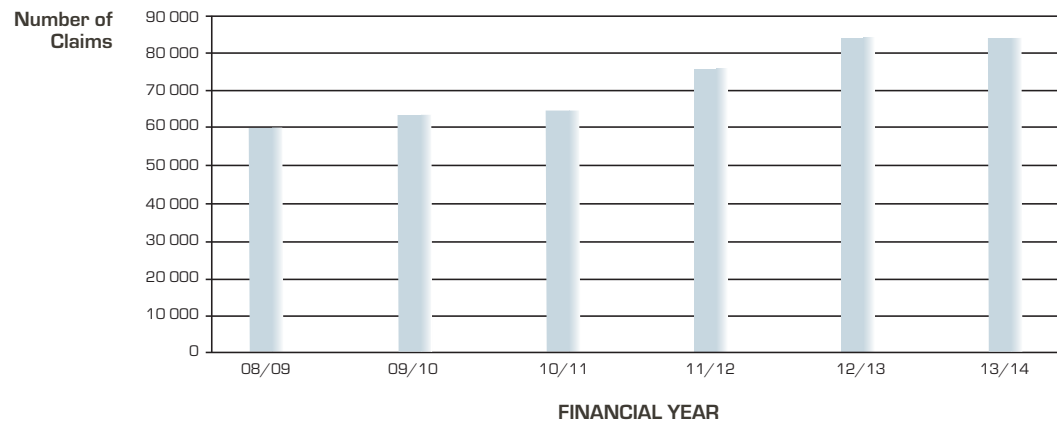




## FREE BASIC ELECTRICITY CLAIMS PER MONTH

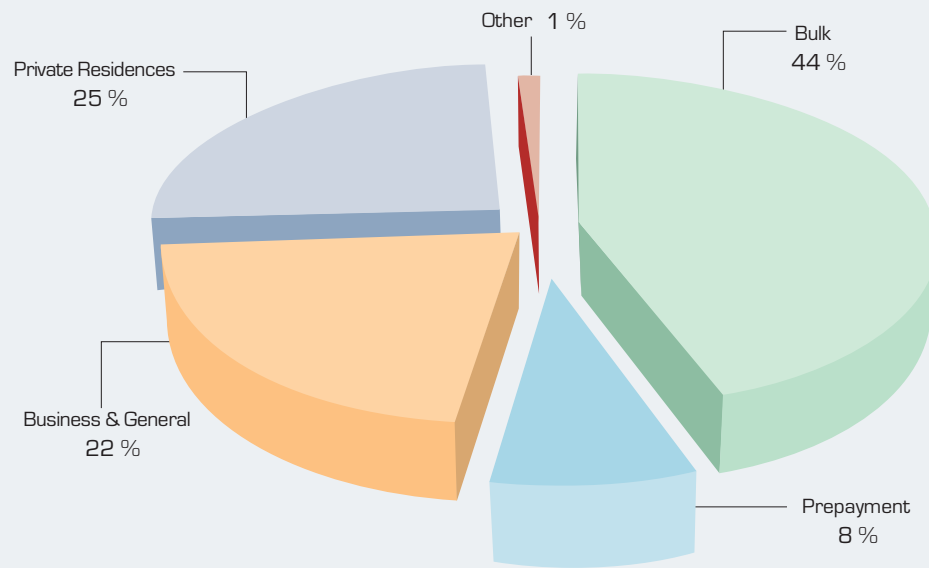
Qualifying Customers ■ Total Claims ●

Claims

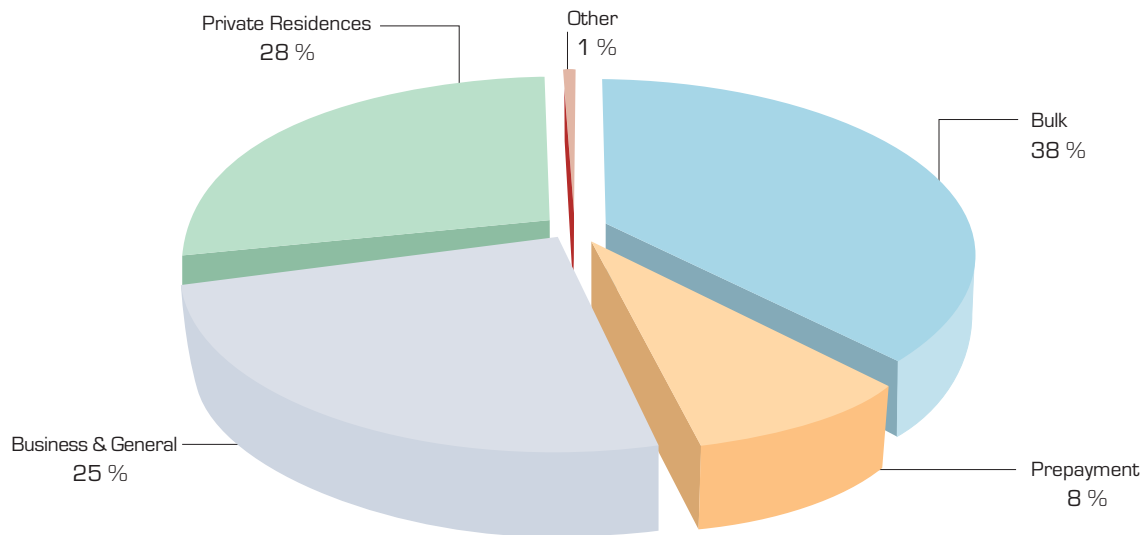


## AVERAGE MONTHLY FREE BASIC ELECTRICITY CLAIMS PER YEAR

Average Monthly FBE Claims Per Year ■

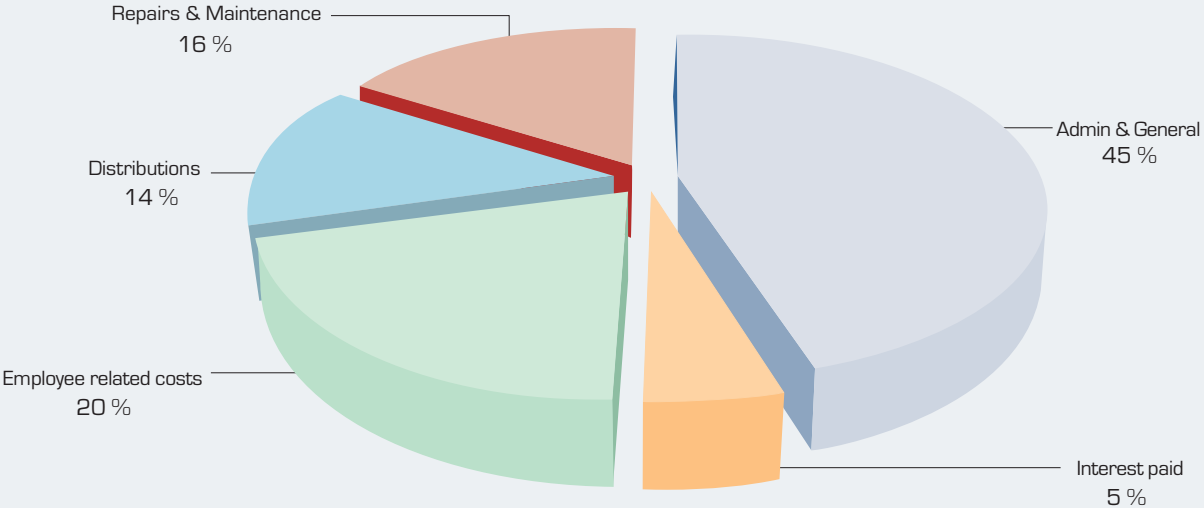


**DISTRIBUTION OF ENERGY SALES 2013/2014**

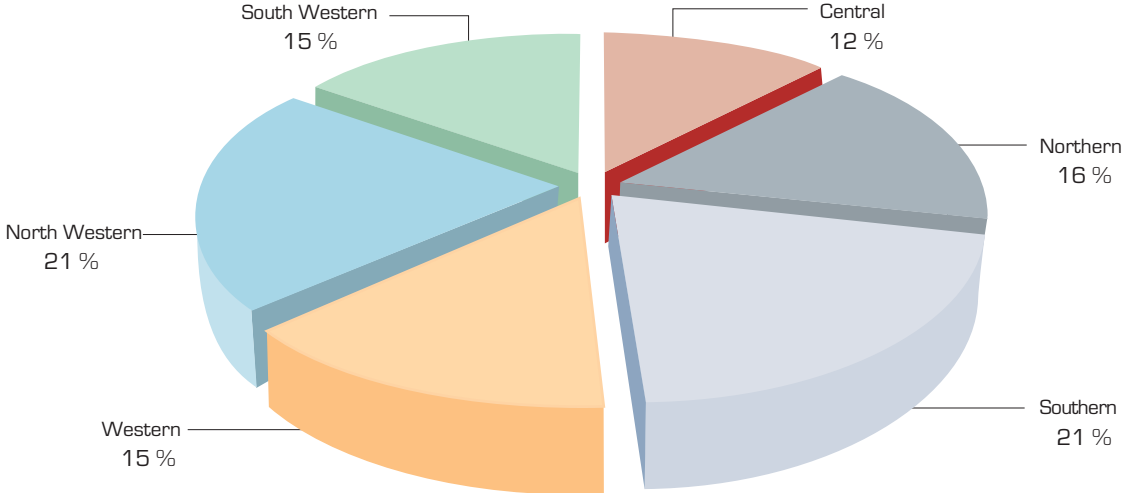


**DISTRIBUTION OF REVENUE FROM SALES 2013/2014**

### DISTRIBUTION OF EXPENDITURE 2013/2014



### NEW CONNECTIONS PER REGION 2013/2014



# Annual Financial Statements

## STATEMENT OF FINANCIAL POSITION AT 30 JUNE 2014

	NOTE	JUNE 2014 R	JUNE 2013 R				
<b>NET ASSETS AND LIABILITIES</b>				<b>ASSETS</b>			
<b>Net Assets</b>		<b>5 752 787 466</b>	<b>4 947 050 303</b>	<b>Non-current assets</b>		<b>5 174 920 408</b>	<b>4 894 565 312</b>
Capital replacement reserve		2 114 413 739	1 782 789 970	Property, plant and equipment	5	5 086 464 532	4 804 436 694
Capitalisation reserve		0	0	Intangible Assets	18	67 569 897	69 242 638
Government grant reserve		1 092 527 932	904 747 053	Investments	6	20 885 980	20 885 980
Donations and public contribution reserves		189 749 262	174 810 952	<b>Current assets</b>		<b>4 953 777 788</b>	<b>4 153 686 591</b>
Self-insurance reserve		0	0	Inventory	7	105 448 087	77 513 184
COVID reserve		0	0	Consumer debtors	8	1 002 073 518	955 152 309
Revaluation reserve		0	0	Other debtors	9	154 254 378	170 286 988
Accumulated Surplus/(Deficit)		2 356 096 533	2 084 702 327	VAT	19	0	0
				Bank balances and cash	20	3 692 001 804	2 950 734 110
<b>LIABILITIES</b>				<b>Total Assets</b>		<b>10 128 698 196</b>	<b>9 048 251 903</b>
<b>Non-current liabilities</b>		<b>2 067 360 913</b>	<b>2 012 153 177</b>				
Long-term liabilities	1	2 067 360 913	2 012 153 177				
Non-current provisions		0	0				
<b>Current liabilities</b>		<b>2 308 549 817</b>	<b>2 089 048 423</b>				
Consumer deposits	2	1 117 295 716	927 998 722				
Provisions		0	0				
Creditors	3	1 134 299 821	1 116 536 111				
Staff leave		44 007 999	38 582 498				
Unspent conditional grants and receipts	94050	0	295 000				
VAT	4	12 946 280	5 636 091				
Bank overdraft		0	0				
<b>Total Net Assets and Liabilities</b>		<b>10 128 698 196</b>	<b>9 048 251 903</b>				

STATEMENT OF FINANCIAL PERFORMANCE FOR THE YEAR ENDED 30 JUNE 2014

	Note	ACTUALS 2014 R	ADJ. BUDGET 2014 R	ACTUALS JUNE 2013 R
<b>REVENUE - Exchange Transactions</b>				
Service Charges	11	9 631 514 315	9 947 020 310	9 326 203 374
Rental of Facilities and Equipment		403 184	399 610	370 299
Interest Earned		119 328 162	103 981 030	93 151 258
Interest Earned - Outstanding Debtors		26 545 993	22 575 000	22 243 393
Other Income	12	126 666 563	123 918 490	123 029 666
Public Contributions and Donations	00504	15 039 015	15 000 000	45 293 587
Gains on disposal of Prop; Plant; Equip	00505	653 039	3 000 000	1 789 165
Internal Income		255 434 045	223 223 820	243 846 894
<b>Total Revenue from exchange transactions</b>		<b>10 175 584 316</b>	<b>10 439 118 260</b>	<b>9 855 927 634</b>
<b>Revenue from non-exchange transactions</b>				
<b>Transfer revenue</b>				
Government Grants and Subsidies	13	233 945 964	258 945 960	229 256 935
<b>Total Revenue from non-exchange transactions</b>		<b>233 945 964</b>	<b>258 945 960</b>	<b>229 256 935</b>
<b>Total Revenue</b>		<b>10 409 530 280</b>	<b>10 698 064 220</b>	<b>10 085 184 569</b>
<b>EXPENDITURE</b>				
Employee Related Costs	14	784 379 331	923 120 920	732 829 695
Contribution to Provision for Bad Debts		-2 378 812	24 443 500	28 355 274
Depreciation		244 144 931	269 291 790	238 271 099
Repairs and Maintenance		613 840 961	659 644 870	520 567 882
Interest Paid	15	199 105 322	238 633 650	216 737 290
Bulk Purchases	16	6 319 701 132	6 542 746 590	6 190 306 793
Contracted Services		157 995 204	217 665 810	178 754 110
General Expenses		174 181 200	220 107 580	167 146 524
Loss on disposal of Prop; Plant; Equip	20445	148 868	1 000 000	555 356
Internal Charges		393 415 232	403 919 810	403 640 746
<b>Total Expenditure</b>		<b>8 884 533 370</b>	<b>9 500 574 520</b>	<b>8 677 164 768</b>
<b>OPERATING SURPLUS</b>				
Cross Subsidisation		-715 815 672	-729 876 050	-659 791 740
Other		-809 181 238	-467 613 650	-748 228 061
<b>SURPLUS FOR THE YEAR</b>		<b>0</b>	<b>0</b>	<b>0</b>

## STATEMENT OF CHANGES IN NET ASSETS FOR THE YEAR ENDED 30 JUNE 2014

	Housing Development Fund	Capital Replacement Reserve	Capitalisation Reserve	Government Grant Reserve	Donations and Public Contributions Reserve	Self- Insurance Reserve	C.O.I.D. Reserve	Revaluation Reserve	Accumulated Surplus / [Deficit]	TOTAL
	R	R	R	R	R	R	R	R	R	R
Opening Balance 01 July 2012	0	1 540 958 083	0	713 932 034	124 754 665	0	0	0	1 814 442 349	4 194 087 131
Adjustments - Asset Life Ext. (Note 21)	0	0	0	0	0	0	0	0	0	0
Adjustments - Conditions of service		2 155 144							-2 155 144	0
Opening Balance 01 July 2012 as restated	0	1 543 113 227	0	713 932 034	124 754 665	0	0	0	1 812 287 205	4 194 087 131
Surplus / [Deficit] for the year	0	0	0	0	0	0	0	0	748 164 456	748 164 456
Transfer to Capital Replacement Reserve	0	507 356 772	0	0	0	0	0	0	-507 356 772	0
PPE purchased	0	-268 968 959	0	0	0	0	0	0	268 968 959	0
Capital Grants used to purchase PPE	0	0	0	229 256 935	0	0	0	0	-229 256 935	0
Donated / contributed PPE	0	0	0	0	55 122 322	0	0	0	-55 122 322	0
Contribution to Insurance Reserve	0	0	0	0	0	0	0	0	0	0
Insurance claims processed	0	0	0	0	0	0	0	0	0	0
Transfer to Housing Development Fund	0	0	0	0	0	0	0	0	0	0
Offsetting of Depreciation	0	0	0	-38 441 915	-5 066 035	0	0	0	43 507 950	0
Closing Balance at 30 June 2013 as restated	0	1 781 501 040	0	904 747 053	174 810 952	0	0	0	2 081 192 542	4 942 251 587
2013										
Adjustments - Asset Life Ext. (Note 22)									4 798 716	4 798 716
Change in accounting policy										0
Adjustments - Conditions of service		1 288 930							-1 288 930	0
Re-stated Balance	0	1 782 789 970	0	904 747 054	174 810 951	0	0	0	2 084 702 327	4 947 050 302
Surplus / [Deficit] for the year	0	0	0	0	0	0	0	0	805 737 164	805 737 164
Transfer to Capital Replacement Reserve	0	603 017 977	0	0	0	0	0	0	-603 017 977	0
PPE purchased	0	-271 394 208	0	0	0	0	0	0	271 394 208	0
Capital Grants used to purchase PPE	0	0	0	233 945 964	0	0	0	0	-233 945 964	0
Donated / contributed PPE	0	0	0	0	15 039 015	0	0	0	-15 039 015	0
Contribution to Insurance Reserve	0	0	0	0	0	0	0	0	0	0
Insurance claims processed	0	0	0	0	5 691 071	0	0	0	-5 691 071	0
Transfer to Housing Development Fund	0	0	0	0	0	0	0	0	0	0
Offsetting of Depreciation / Asset Disposals	0	0	0	-46 165 086	-5 791 775	0	0	0	51 956 861	0
Balance at 30 June 2014	0	2 114 413 739	0	1 092 527 932	189 749 262	0	0	0	2 356 096 533	5 752 787 466
Reconciliation of Surplus for the year 2013										
Surplus for the year		552 106 820								
Capital Replacement Reserve Transfer		50 911 155								
PPE Purchased:										
Capital Grants used to purchase PPE		233 945 964								
Donations and Public Contributions		20 730 087								
Offsetting of Depreciation		-51 956 861								
Total Received for the Year		805 737 164								



## 5. PROPERTY, PLANT AND EQUIPMENT

### Reconciliation of Carrying Value

#### Carrying Values at 1 July 2013

	Land	Buildings	Infrastructure	Plant & Equip.	Total
	R	R	R	R	R
Carrying Values at 1 July 2013	131 531 225	104 278 431	4 266 157 168	297 671 162	4 799 637 978
Cost	131 531 225	135 186 384	6 214 924 397	589 050 684	7 070 692 690
Valuation	0	0	0	0	0
Accumulated depreciation	0	-30 907 953	-1 948 767 229	-291 379 522	-2 271 054 704
- Cost	0	-31 543 008	-1 959 889 210	-320 490 734	-2 311 922 952
- Revaluation	0	635 055	11 121 981	29 111 212	40 868 248
Acquisitions	0	12 210 321	360 302 035	93 287 858	465 800 214
Capital under construction	0	9 746 640	48 076 342	643 324	58 466 307
Increases/decreases in revaluation	0	0	0	0	0
Transfers - Cost	0	0	0	0	0
Transfers - Depreciation	0	0	0	0	0
Depreciation	0	-2 531 430	-184 986 568	-48 415 370	-235 933 367
- based on cost	0	-2 531 430	-184 986 568	-48 415 370	-235 933 367
- based on revaluation	0	0	0	0	0
Carrying value of disposals	0	0	-52 294	-121 792	-174 086
Cost/revaluation	0	-56 860	-5 030 568	-4 313 822	-9 401 250
Accumulated depreciation	0	56 860	4 978 275	4 192 030	9 227 164
Impairment losses	0	0	-437 490	-958 643	-1 396 133
Other movements - Intangible Assets - Cost	0	0	0	0	0
Other movements - Intangible Assets - Accumulated Depreciation	0	0	0	0	0
Carrying values at 30 June 2014	131 531 225	123 703 955	4 489 122 817	342 106 543	5 086 464 532
Cost	131 531 225	157 086 486	6 618 272 205	678 668 044	7 585 557 960
Revaluation	0	0	0	0	0
Accumulated depreciation	0	-33 328 531	-2 129 149 389	-336 561 501	-2 499 093 420
- Cost	0	-34 017 586	-2 140 271 370	-365 672 713	-2 539 961 668
- Revaluation	0	635 055	11 121 981	29 111 212	40 868 248



Reconciliation of Carrying Value

Carrying Values at 1 July 2012

	Land R	Buildings R	Infrastructure R	Plant & Equip. R	Total R
Cost	127 148 551	106 654 609	5 832 484 097	485 067 258	6 551 354 515
Valuation	0	0	0	0	0
Accumulated depreciation	0	-28 580 219	-1 838 463 796	-250 823 508	-2 117 867 523
- Cost	0	-29 215 274	-1 849 585 777	-279 934 720	-2 158 735 771
- Revaluation	0	635 055	11 121 981	29 111 212	40 868 248
Acquisitions	4 382 674	11 787 245	263 561 383	86 429 309	366 160 611
Capital under construction	0	16 744 530	188 883 900	27 452 028	233 080 458
Increases/decreases in revaluation	0	0	0	0	0
Transfers - Cost	0	0	0	0	0
Transfers - Depreciation	0	0	0	0	0
Depreciation	0	-2 327 734	-179 651 884	-50 114 472	-232 094 090
- based on cost	0	-2 327 734	-179 651 884	-50 114 472	-232 094 090
- based on revaluation	0	0	0	0	0
Carrying value of disposals	0	0	-656 532	-339 453	-995 985
Cost/revaluation	0	0	-70 004 983	-9 897 911	-79 902 894
Accumulated depreciation	0	0	69 348 451	9 558 458	78 906 909
Impairment losses	0	0	0	0	0
Other movements - Intangible Assets - Cost	0	0	0	0	0
Other movements - Intangible Assets - Accumulated Depreciation	0	0	0	0	0

Carrying values at 30 June 2013

Cost	131 531 225	135 186 384	6 214 924 397	589 050 684	7 070 692 690
Revaluation	0	0	0	0	0
Accumulated depreciation	0	-30 907 953	-1 948 767 229	-291 379 522	-2 271 054 704
- Cost	0	-31 543 008	-1 959 889 210	-320 490 734	-2 311 922 952
- Revaluation	0	635 055	11 121 981	29 111 212	40 868 248



Summary of Debtors by Customer Classification

30 JUNE 2014

Current (0 - 30 days)

31 - 60 Days

61 - 90 Days

91 - 120 Days

121 - 365 Days

+365 Days

Sub-total

Less: Provision for bad debts

Total debtors by customer classification

Summary of Debtors by Customer Classification

30 JUNE 2013

Current (0 - 30 days)

31 - 60 Days

61 - 90 Days

91 - 120 Days

121 - 365 Days

+365 Days

Sub-total

Less: Provision for bad debts

Total debtors by customer classification

Reconciliation of bad debts provision

Balance at beginning of the year

Contributions to Provision

Bad debts Written off against provision

	Consumers R	Industrial/ Commercial R
30 JUNE 2014		
Current (0 - 30 days)	404 197 516	420 350 478
31 - 60 Days	65 558 946	44 791 432
61 - 90 Days	19 102 781	5 728 479
91 - 120 Days	11 731 529	1 703 536
121 - 365 Days	189 585 655	10 481 523
+365 Days	0	0
Sub-total	690 176 427	483 055 447
Less: Provision for bad debts	-160 297 929	-10 860 427
Total debtors by customer classification	529 878 498	472 195 020
30 JUNE 2013		
Current (0 - 30 days)	420 496 200	394 239 276
31 - 60 Days	52 527 605	38 223 065
61 - 90 Days	15 938 735	6 421 952
91 - 120 Days	14 987 170	3 762 199
121 - 365 Days	168 245 526	12 614 006
+365 Days	0	0
Sub-total	679 195 236	455 260 499
Less: Provision for bad debts	-144 635 664	-34 667 762
Total debtors by customer classification	534 559 572	420 592 737
	JUNE 2014	JUNE 2013
	R	R
Balance at beginning of the year	179 303 426	172 010 196
Contributions to Provision	-1 210 152	29 640 000
Bad debts Written off against provision	-6 934 918	-22 346 770
	171 158 356	179 303 426

9. OTHER DEBTORS

Insurance Recoverables  
 Private Jobs - Cost of Work done  
 Prepayment Meter Token Sales  
 Sundry Debtors - General  
 Metro Water  
 Mechanical Workshops  
 Debtors Capital  
 Insurance Sundry Accounts  
 Apprentice Tools Cost/Recovery  
 CL A/C - Refuse Disposal  
 Corporate Services  
 Payments ex Sundries  
 Mechanical Workshops - Consumables  
 Sundry Debtors clearing account

JUNE 2014 R	JUNE 2013 R
108 633 314	115 771 073
12 741 841	10 749 282
22 523 448	13 173 833
8 965 122	28 792 429
0	0
0	0
1 389 728	1 324 706
0	469 608
926	6 057
0	0
0	0
0	0
0	0
154 254 378	170 286 988

10. BANK, CASH & OVERDRAFT BALANCES

EThekweni Electricity has the following bank accounts:

Electricity Expenditure Account

Standard Bank - Kingsmead - Account Number 050134701

Cash book balance at beginning of year  
 Cash book balance at end of year  
 Bank statement balance at beginning of year  
 Bank statement balance at end of year

104 062 644	78 474 625
130 374 394	104 062 644
2 998 252	3 195 785
1 723 790	2 998 252

Electricity EFT Account

Standard Bank - Kingsmead - Account Number 050133608

Cash book balance at beginning of year  
 Cash book balance at end of year  
 Bank statement balance at beginning of year  
 Bank statement balance at end of year

20 000 019 489	11 548 550 022
28 621 214 301	20 000 019 489
614 401 966	611 960 369
639 653 132	614 401 966

Electricity Foreign Exchange Account

Standard Bank - Kingsmead - Account Number 050134698

Cash book balance at beginning of year  
 Cash book balance at end of year  
 Bank statement balance at beginning of year  
 Bank statement balance at end of year

JUNE 2014 R	JUNE 2013 R
9 113 653	5 389 985
14 508 233	9 113 653
923 442	5 390 177
0	923 442

11. SERVICE CHARGES

00101 - Bulk Supply
00102 - Business Cooking - Scale 5
00103 - Business and General Scale 1
00106 - Industrial Water Heating & Pumping
00107 - Prepayment Meters - FBE
00108 - Prepayment Meters
00109 - Residential Scale 3 and 4
00111 - Sundry Income - Private Lights
00112 - Two Rate - Scale 2
00120 - Poverty Relief/Indigent/EBBST
00122 - Income Foregone - Load Shedding
20300 - Electricity
20385 - Free Basic Electricity - Municipality
Total Service Charges

ACTUALS JUNE 2014	ADJ. BUDGET JUNE 2014	ACTUALS JUNE 2013
3 744 530 467	3 863 091 710	3 635 164 500
32 646 024	36 550 000	34 412 598
1 876 794 388	1 896 849 220	1 767 739 657
9 025 222	11 793 750	9 694 196
59 927 942	61 272 000	57 791 707
753 980 805	741 996 500	699 226 704
2 772 408 183	2 898 719 000	2 710 411 169
1 522 568	1 353 510	1 152 232
393 118 017	448 375 000	420 919 901
70 364 643	71 951 000	67 305 385
0	0	0
-12 439 301	-12 980 380	-10 309 290
-70 364 643	-71 951 000	-67 305 385
9 631 514 315	9 947 020 310	9 326 203 374

12. OTHER INCOME

00119 - Traffic Signals
00201 - Surcharge Business Levy
00202 - EB Steam - Wheeling Charges
00204 - Lotus Park - Wheeling Charges
00205 - Wheeling Incentive
00405 - Admin Charge - PAFC & Insurance
00408 - Meter Reconnection and Test Fees
00412 - Sundry Income - Taxable
00413 - Sundry Sales
00416 - Settlement Discount
00417 - Tender Document Fees
00418 - Sweep Reconnection Fees
00425 - Training - Local Government
00426 - Training - Contractors
00427 - Training - Outside Organisations
00431 - Meter Test Fees
00434 - Promotional Items
00435 - Proceeds from Insurance - Operating
00455 - Rural Electrification Project
00506 - Prepayment Connection Fees
00507 - Conventional Connection Fees
00508 - Proceeds from Insurance - Capital
Total Other Income

2 295 458	1 563 530	1 810 513
0	0	0
0	0	0
249 608	110 250	81 329
146 478	157 500	136 888
6 006 903	3 295 800	8 396 345
19 470 110	20 790 000	18 809 764
13 024 081	1 313 100	4 043 453
584 556	1 314 820	2 511 130
1 229 096	1 575 000	1 266 024
307 800	273 000	264 150
270 205	945 000	702 681
71 403	72 920	51 689
135 219	243 080	166 390
682 859	636 490	590 863
35 789	63 000	60 867
9 003	2 500	6 695
22 754 733	27 562 500	21 852 904
0	0	0
13 059 224	9 000 000	14 183 832
40 642 968	45 000 000	38 265 415
5 691 071	10 000 000	9 828 734
126 666 563	123 918 490	123 029 666

### 13. GOVERNMENT GRANTS AND SUBSIDIES

00121 - Municipal Infrastructure Grant
00123 - Equitable Share
00500 - Capital Grant - Urban Settlement Development
00501 - Capital Grant - Demandside Management
00502 - Capital Grant - Equit Share
00503 - Capital Grant - Electr. Prog
<b>Total Government Grants and Subsidies</b>

#### 13.1 Urban Settlement Development Grant 0500

Balance unspent at beginning of year
Current years receipts
Conditions met - transferred to revenue
Conditions still to be met - transferred to liabilities

#### 13.2 Electrification Programme - INEP

Balance unspent at beginning of year
Current years receipts
Conditions met - transferred to revenue
Conditions still to be met - transferred to liabilities

#### 13.3 Equitable Share

Balance unspent at beginning of year
Current years receipts
Conditions met - transferred to revenue
Conditions still to be met - transferred to liabilities

#### 13.4 SANEDI Grant

Balance unspent at beginning of year
Current years receipts
Conditions met - transferred to revenue
Conditions still to be met - transferred to liabilities

#### 13.5 Demand Management Grant

Balance unspent at beginning of year
Current years receipts
Conditions met - transferred to revenue
Conditions still to be met - transferred to liabilities

#### 13.6 DANIDA Grant

Balance unspent at beginning of year
Current years receipts
Utilised portion of grant - repaid
Conditions still to be met - transferred to liabilities

ACTUALS JUNE 2014	ADJ. BUDGET JUNE 2014	ACTUALS JUNE 2013
0	0	0
0	0	0
141 319 000	141 319 000	133 527 984
0	10 000 000	20 148 806
72 626 964	72 626 960	70 580 145
20 000 000	35 000 000	5 000 000
<b>233 945 964</b>	<b>258 945 960</b>	<b>229 256 935</b>
0	0	0
141 319 000	133 527 984	133 527 984
-141 319 000	-133 527 984	-133 527 984
0	0	0
0	0	0
20 000 000	5 000 000	5 000 000
-20 000 000	-5 000 000	-5 000 000
0	0	0
0	0	0
72 626 964	70 580 145	70 580 145
-72 626 964	-70 580 145	-70 580 145
0	0	0
0	0	0
0	0	0
0	0	0
0	20 148 806	20 148 806
0	0	0
0	-20 148 806	-20 148 806
0	0	0
295 000	295 000	295 000
0	0	0
-295 000	0	0
0	295 000	295 000

14. EMPLOYEE RELATED COSTS

10118 - BACKPAY - CONDITIONS OF SERVICE
10100 - Staff Salaries
10101 - Staff Overtime
10104 - Pensioners Medical Aid
10105 - Council Pensions
10106 - Housing Subsidy
10107 - Durban Pension Fund
10110 - Medical Aid
10112 - Long Service Award
10116 - Holiday Bonus
10120 - Market/Scarce Skills Allowance
10122 - Emergency Sustenance
10198 - Task Implementation
10199 - Contingency Staff Vacancy
10220 - Cell Phone Allowances
10300 - Executive Packages
10400 - Locomotion Allowances
10401 - Travelling Allowances
10402 - Telephone Allowances
10403 - Travel and Subsistence
10500 - Temporary Staff
10501 - Uniforms
10502 - Education Fees
10503 - Travel & Removal Costs
10506 - Unemployment Insurance Fund
10507 - Employment Services
10508 - Leave Comm - Trf Ex Provision
10510 - Employ - Cost Capitalised Offset
10700 - Ward Committee Training

Total Employee Related Costs

ACTUALS JUNE 2014	ADJ. BUDGET JUNE 2014	ACTUALS JUNE 2013
2 180 298	5 650 000	0
433 390 170	474 170 690	398 345 768
90 223 561	99 510 000	92 339 875
10 869 650	10 918 850	9 536 737
5 646 150	5 701 800	5 802 724
2 228 741	3 770 030	2 313 116
76 635 512	86 547 980	69 333 882
38 835 305	45 738 470	33 777 305
0	0	0
33 691 467	39 704 040	31 117 439
36 064 597	41 401 340	34 423 190
1 778 705	2 205 000	1 154 377
0	2 000 000	0
0	38 189 000	0
3 476 611	3 500 000	3 085 900
9 593 926	10 230 680	9 299 118
39 156 855	39 187 500	35 000 732
0	25 320	8 498
437	450	1 920
171 627	195 500	105 309
4 441 616	6 645 930	4 022 577
4 330 093	4 378 090	2 168 676
1 559 430	1 560 000	940 496
89 928	168 530	70 841
3 636 008	3 945 420	3 408 755
3 983 591	4 250 000	3 122 011
13 451 691	13 460 880	10 845 186
-31 056 638	-19 934 580	-17 395 437
0	0	700
784 379 331	923 120 920	732 829 695

15. INTEREST PAID

29560 - Interest  
 29563 - Interest - Consumer Deposits  
 Total of Interest Paid

16. BULK PURCHASES

00901 - Eskom - Maximum Demand Charge  
 00902 - Eskom - Unit Charge  
 00905 - Service Fees  
 00908 - Elect - Landfill Site - Marianhill  
 00910 - Elect - Hullet Sugar  
 00911 - Elect - Landfill Site - Bisasar Road  
 00912 - Energy Charge (Peak)  
 00913 - Energy Charge (Std)  
 00914 - Energy Charge (Off)  
 00915 - Rate Rebalancing Levy  
 00916 - Environmental Levy  
 00917 - Eskom - Admin. Charge  
 00918 - Transmission Network Charge  
 00919 - Residual Connection Charge  
 00920 - KVARH Surcharge  
 00921 - Energy Charge  
 00922 - Energy Charge  
 00923 - Energy Charge  
 00929 - Co-Generation Energy

Total Bulk Purchases

17. CAPITAL COMMITMENTS

Commitments in respect of Capital Expenditure:  
 Approved and contracted for - Electricity  
 Approved but not yet contracted for - Electricity

Total

This expenditure will be financed from:  
 Government Grants  
 Own Resources

	ACTUALS JUNE 2014	ADJ. BUDGET JUNE 2014	ACTUALS JUNE 2013
29560 - Interest	189 800 321	229 316 650	207 330 310
29563 - Interest - Consumer Deposits	9 305 001	9 317 000	9 406 980
<b>Total of Interest Paid</b>	<b>199 105 322</b>	<b>238 633 650</b>	<b>216 737 290</b>
00901 - Eskom - Maximum Demand Charge	4 779 054	5 674 680	347 654 847
00902 - Eskom - Unit Charge	5 407 328	5 959 870	4 473 538
00905 - Service Fees	942 248	957 950	882 433
00908 - Elect - Landfill Site - Marianhill	2 485 067	3 233 340	2 612 092
00910 - Elect - Hullet Sugar	0	1 900 000	0
00911 - Elect - Landfill Site - Bisasar Road	19 583 927	27 076 500	22 683 663
00912 - Energy Charge (Peak)	1 800 130 258	1 905 742 480	1 758 570 403
00913 - Energy Charge (Std)	2 135 657 930	2 135 669 290	1 792 790 551
00914 - Energy Charge (Off)	1 327 155 576	1 416 423 640	1 182 355 063
00915 - Rate Rebalancing Levy	578 807 388	593 627 720	519 178 378
00916 - Environmental Levy	0	0	398 657 801
00917 - Eskom - Admin. Charge	208 830	212 160	160 217
00918 - Transmission Network Charge	172 540 409	173 012 160	158 102 288
00919 - Residual Connection Charge	501 552	501 580	501 552
00920 - KVARH Surcharge	11 969	38 650	5 676
00921 - Energy Charge	104 297	645 340	0
00922 - Energy Charge	26 058 153	26 721 870	0
00923 - Energy Charge	241 464 564	241 464 590	0
00929 - Co-Generation Energy	3 862 583	3 884 770	1 678 291
<b>Total Bulk Purchases</b>	<b>6 319 701 132</b>	<b>6 542 746 590</b>	<b>6 190 306 793</b>
Approved and contracted for - Electricity	66 209 440	3 587 040	
Approved but not yet contracted for - Electricity	332 370 230	554 717 511	
<b>Total</b>	<b>398 579 670</b>	<b>558 304 551</b>	
Government Grants	0	0	
Own Resources	398 579 670	558 304 551	



18. INTANGIBLE ASSETS

Servitudes

Opening Balance  
Acquisitions  
Disposals - Cost

JUNE 2014  
R

48 362 676  
72 827  
0  
48 435 503

JUNE 2013  
R

48 190 078  
172 598  
0  
48 362 676

Computer Software

Opening Balance  
Accumulated Depreciation

20 879 962  
0  
20 879 962

20 437 274  
0  
20 437 274

Acquisitions  
Work in Progress  
Disposals  
Depreciation for the year  
Transfers - Cost  
Transfer - Depreciation  
Disposals - Cost  
Disposals - Depreciation

1 368 220  
362 691  
-37 238  
-3 439 242  
0  
0  
0  
0

361 304  
6 321 997  
0  
-6 240 613  
0  
0  
0  
0

19 134 394

20 879 962

19. VAT

Vat Receivable

0

0

20. BANK AND CASH BALANCES

3 692 001 804

2 950 734 110

## 21. LOSS IN ELECTRICITY DISTRIBUTION

Estimated Electricity losses 687 009 986 kWh (2013: 667 412 169 kWh) occurred during the year under review which resulted in revenue losses to the municipality. These estimated electricity losses amounted to R424 million (2013: R396 m)

The norm for electricity losses ranges from 5.6 % to 12 %. The loss incurred by the municipality is 6.11 % (2013: 5.85 %) and is due to a combination of transmission/distribution losses and losses due to illegal connections. In comparison to other Metro's, eThekweni Municipality maintains its losses at a lower end of the norm.

Transmission losses are inevitable, however, the following interventions have been implemented:

### ■ OPTIMAL NETWORK CONFIGURATION

The Planning and Design engineers ensure that all network additions are implemented with correct equipment ratings and configuration so as to minimize losses.

### ■ EFFECTIVE MAINTENANCE ON NETWORK

The unit has adopted a comprehensive maintenance schedule to promote the reliability of the network as well as enhance the efficiency of the network.

### ■ EFFICIENT NETWORK LOADING

Power flow into the network is carefully monitored on a 24 hour basis and the correct, most efficient electrical loading configuration is adopted. Illegal electricity connections are a major contributing factor to non-technical losses.

The following interventions have been implemented to curb illegal connections:

### ■ AREA SWEEPS

The Revenue Protection teams continuously investigate high theft area's to remove all illegal connections.

### ■ EMPLOYMENT OF SECURITY INTELLIGENCE TEAMS

Private investigators are deployed to site to try and gather evidence to apprehend suspects.

### ■ INSTALLATION OF ANTI-THEFT TECHNOLOGIES AT SUBSTATIONS

The employment of this technology deters intruders from entering into substations and carrying out illegal connections.

### ■ THEFT HOTLINE

A 24 hour hotline has been set up to report acts of theft and illegal connections - Once a suspicious activity is reported, security will be despatched immediately to the affected site.

## 22. ASSETS PRIOR YEAR ADJUSTMENTS

Adjustments were made to amounts previously reported in the annual financial statements arising from the full compliance of GRAP 17 standards as per Government Gazette no. 30013.

### ■ PROPERTY, PLANT AND EQUIPMENT

During the year the municipality changed its accounting policy for property, plant and equipment so as to comply more fully with GRAP 17 standards. The useful lives of fully depreciated assets were reviewed and resulted in changes in certain categories of assets.

# Statistical Data: Customer Base Statistics

NOTE: \* Adjusted to registered meters on database  
 \*\* Adjusted to include total connections added for year

	02 / 03*	03 / 04*	04 / 05*	05 / 06*	06 / 07*	07 / 08*	08 / 09*	09/10*	10/11*	11/12*	12/13**	13/14 **
<b>NUMBER OF CUSTOMERS</b>												
Business & General	39 374	42 952	44 143	42 010	42 980	44 261	44 832	45 007	44 213	43 879	44 654	44 344
Private Residences	304 831	307 608	310 955	314 975	319 516	323 389	326 386	327 002	324 044	321 904	322 844	319 875
Other	1 563	1 449	1 398	1 173	4	4	4	4	4	4	4	4
Bulk	725	734	739	748	730	746	744	769	821	819	888	959
Prepayment	187 044	211 784	227 895	243 549	254 017	263 712	275 670	289 946	305 977	333 434	342 705	358 411
Total	533 537	564 527	585 130	602 455	617 247	632 112	647 636	662 728	675 059	700 040	711 095	723 593
<b>UNITS (kWh)</b>												
Business & General	1 906 430 575	1 912 939 115	1 900 283 815	1 887 628 514	2 161 999 560	2 203 077 556	2 205 258 603	2 662 458 083	2 921 756 030	2 723 355 860	2 367 758 535	2 263 456 147
Private Residences	2 860 048 650	2 862 123 618	2 873 337 222	2 900 907 487	3 006 373 582	3 013 288 241	2 900 914 449	2 826 464 091	2 500 569 276	2 495 936 487	2 680 118 904	2 644 041 922
Other	86 911 187	132 286 050	140 222 213	123 385 815	36 693 199	37 605 719	37 677 922	39 678 620	41 785 554	86 221 641	95 297 605	112 538 964
Bulk	4 780 752 550	4 931 845 221	5 029 924 160	5 056 990 152	5 105 603 247	5 221 414 480	5 037 894 890	4 621 341 025	4 582 863 945	4 666 663 006	4 781 979 791	4 688 943 005
Prepayment	380 972 540	451 783 592	514 181 235	587 881 511	652 855 481	687 805 495	738 475 562	774 714 890	789 573 652	826 397 419	819 810 059	840 892 154
Total	10 015 115 502	10 290 977 596	10 457 948 645	10 556 793 479	10 963 525 073	11 163 191 492	10 920 221 425	10 924 656 709	10 836 548 456	10 798 574 412	10 744 964 894	10 549 872 192
<b>UNITS GROWTH</b>												
Business & General	9.95%	0.34%	0.34%	-6.91%	14.54%	1.90%	0.10%	20.73%	9.74%	-6.79%	-13.06%	-4.41%
Private Residences	6.25%	0.07%	0.07%	0.96%	3.64%	0.23%	-3.73%	-2.57%	-11.53%	-0.19%	7.38%	-1.35%
Other	-15.16%	52.21%	52.21%	-12.01%	-70.26%	2.49%	0.19%	5.31%	5.31%	106.34%	10.53%	18.09%
Bulk	0.47%	3.16%	3.16%	3.15%	0.96%	2.27%	-3.51%	-8.27%	-0.83%	1.83%	2.47%	-1.95%
Prepayment	25.87%	18.59%	18.59%	14.33%	11.05%	5.35%	7.37%	4.91%	1.92%	4.66%	-0.80%	2.57%
Total	4.44%	2.75%	1.62%	0.95%	3.85%	1.82%	-2.18%	0.04%	-0.81%	-0.35%	-0.50%	-1.82%
<b>INCOME IN RANOS</b>												
Business & General	591 530 415	619 394 717	672 858 784	687 641 951	779 362 349	844 191 522	1 075 040 391	1 391 466 489	1 767 021 296	2 064 278 962	2 232 766 352	2 486 098 587
Private Residences	824 037 901	894 861 179	941 481 632	981 363 145	1 090 027 087	1 150 908 334	1 416 756 093	1 783 179 755	2 153 301 353	2 534 662 071	2 710 411 169	2 772 408 183
Other	15 775 113	18 036 972	22 214 691	20 181 773	13 433 024	15 189 096	19 709 806	25 294 174	36 500 000	51 154 591	51 019 905	50 940 590
Bulk	965 030 032	1 079 243 856	1 062 055 560	1 153 442 450	1 231 234 899	1 353 175 863	1 711 042 139	2 091 798 008	2 658 783 133	3 207 748 156	3 635 164 500	3 744 530 467
Prepayment	134 997 906	154 263 532	168 477 331	204 733 254	241 183 183	275 381 501	377 042 920	494 949 284	584 894 116	695 382 979	757 018 411	813 908 747
Total	2 531 371 367	2 765 800 256	2 867 087 998	3 047 362 573	3 355 240 542	3 638 846 315	4 599 591 348	5 786 687 710	7 200 499 898	8 553 226 758	9 386 380 338	9 867 886 574
<b>CENTS/UNIT</b>												
Business & General	31.03	32.38	35.41	36.43	36.05	38.32	48.75	52.26	60.48	75.80	94.30	109.84
Private Residences	28.81	31.27	32.77	33.83	36.26	38.19	48.84	63.09	86.11	101.55	101.13	104.85
Other	18.15	13.63	15.84	16.36	36.61	40.39	52.31	63.75	87.35	59.33	53.54	45.26
Bulk	20.19	21.88	21.11	22.81	24.12	25.92	33.96	45.26	58.02	68.74	76.02	79.86
Prepayment	35.44	34.15	32.77	34.83	36.94	40.04	51.06	63.89	74.08	84.15	92.34	96.79
Total	25.28	26.88	27.42	28.87	30.60	32.60	42.12	52.97	66.45	79.21	87.36	93.54
<b>AV. UNITS/MNTH/CUST</b>												
Business & General	4 035	3 711	3 542	4 087	4 192	4 148	4 099	4 930	5 507	5 172	4 419	4 254
Private Residences	782	775	747	825	784	776	741	720	643	646	692	689
Other	4 634	7 608	8 359	8 766	764 442	783 452	784 957	826 638	870 532	1 796 284	1 985 367	2 344 562
Bulk	549 512	559 928	567 199	563 390	582 831	583 268	564 280	500 796	465 171	474 833	448 759	407 451
Prepayment	170	178	186	196	214	217	223	223	215	207	199	196
Total	1 564	1 519	1 459	1 509	1 480	1 472	1 405	1 374	1 338	1 285	1 259	1 215
<b>AV. RANOS/MNTH/CUST</b>												
Business & General	1 252	1 202	1 254	1 489	1 511	1 589	1 998	2 576	3 331	3 920	4 167	4 672
Private Residences	225	242	252	260	284	297	362	454	554	656	700	722
Other	841	1 037	1 324	1 434	279 855	316 440	410 621	526 962	760 417	1 065 721	1 062 915	1 061 262
Bulk	110 923	122 530	119 763	128 503	140 552	151 159	191 649	226 679	269 872	326 389	341 138	325 385
Prepayment	60	61	62	70	79	87	114	142	159	174	184	189
Total	395	408	408	422	453	480	592	728	889	1 018	1 100	1 136

# Statistical Data:

## Maximum Demand and Energy Sales per Annum

NOTE: # figures now include sales and purchases for Tongaat, Mpumalanga and Magabeni  
\*Kingsburgh added

Year	MaximumkVA	Percent growth	Energy (kWh) sold	Percent growth	Energy (kWh) purchased	Percent growth	Percent loss	Power factor at system peak	Average monthly load factor	Number of customers
88/89	1 196 636	3.91%	6 986 105 898	6.00%	7 337 830 336	6.50%	4.79%	98.40%	72.73%	252 518
89/90	1 232 618	3.01%	7 201 068 113	3.08%	7 634 669 960	4.05%	5.68%	100.00%	72.92%	284 661
90/91	1 268 538	2.91%	7 426 490 766	3.13%	7 697 377 076	0.82%	3.52%	100.00%	73.87%	290 070
91/92	1 286 335	1.40%	7 548 660 345	1.65%	7 928 532 199	3.00%	4.79%	97.50%	72.90%	299 948
92/93	1 313 385	2.10%	7 688 164 852	1.85%	8 145 319 531	2.73%	5.61%	100.00%	70.80%	329 969
93/94	1 383 431	5.33%	8 047 317 773	4.67%	8 494 913 446	4.29%	5.27%	99.90%	72.80%	359 516
94/95	1 426 277	3.10%	8 202 460 186	1.93%	8 738 907 153	2.87%	6.14%	99.90%	72.90%	386 361
95/96	1 469 256	3.01%	8 419 518 677	2.65%	9 021 770 028	3.24%	6.68%	99.90%	73.46%	428 035
96/97	1 585 122	7.89%	8 941 330 717	6.20%	9 571 358 173	6.09%	6.58%	99.90%	74.37%	451 751
97/98 #	1 585 060	0.00%	9 183 151 356	2.70%	9 813 695 486	2.53%	6.43%	99.90%	76.26%	477 416
98/99 #	1 601 635	1.05%	9 073 412 900	-1.19%	9 851 495 987	0.39%	7.90%	99.90%	76.55%	505 501
99/00 #	1 572 339	-1.83%	9 195 922 772	1.35%	9 956 607 592	1.07%	7.64%	98.60%	77.37%	523 176
00/01 #	1 592 211	1.26%	9 407 440 209	2.30%	10 105 748 000	1.50%	6.91%	98.60%	78.52%	525 551
01/02 #	1 610 173	1.13%	9 589 115 852	1.93%	10 224 641 034	1.18%	6.22%	98.10%	79.45%	548 702
02/03 #	1 650 089	2.48%	10 015 115 502	4.44%	10 552 641 000	3.21%	5.09%	98.00%	78.49%	533 527
03/04 #	1 667 942	1.08%	10 290 977 595	2.75%	10 803 947 948	2.38%	4.75%	99.90%	74.15%	564 527
04/05 #	1 765 855	5.87%	10 457 948 645	1.62%	11 053 953 456	2.31%	5.39%	99.80%	76.53%	585 130
05/06 #	1 783 038	0.97%	10 556 793 479	0.95%	11 186 048 110	1.19%	5.63%	99.90%	72.75%	602 455
06/07 #	1 857 178	4.16%	10 963 525 073	3.85%	11 580 771 534	3.53%	5.33%	98.13%	73.98%	617 247
07/08 #	1 890 043	1.77%	11 163 191 492	1.82%	11 751 787 312	1.48%	5.01%	97.27%	75.90%	632 112
08 / 09 #	1 897 005	0.37%	10 920 221 425	-2.18%	11 504 658 024	-2.10%	5.08%	95.65%	74.42%	647 636
09 / 10 #	1 812 881	-4.43%	10 924 656 709	0.04%	11 495 870 884	-0.08%	5.00%	95.57%	74.24%	662 727
10 / 11 #	1 817 870	0.28%	10 836 548 456	-0.81%	11 467 431 990	-0.25%	5.50%	95.46%	75.00%	675 059
11 / 12 #	1 893 125	4.14%	10 798 574 412	-0.35%	11 463 371 189	-0.04%	5.80%	99.18%	74.42%	700 040
12 / 13 #*	1 828 468	-3.42%	10 744 964 894	-0.50%	11 412 377 063	-0.44%	5.85%	98.91%	74.55%	711 095
13 / 14 #*	1 756 716	-3.92%	10 549 872 192	-1.82%	11 236 882 178	-1.54%	6.11%	98.31%	76.03%	723 593

# Statistical Data: Expenditure per Annum

NOTE: Ratios of Admin and General Distribution have varied as a result of restructuring  
 \* Include depreciation of R160 million not included previously, owing to financial statements now presented as GAAP and GRAP

ITEM OF EXPENDITURE	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14
<b>DISTRIBUTION and Admin</b>												
Admin and general	384 858 119	424 125 981	468 674 230	624 140 246	766 654 479	844 540 463	1 068 195 348	1 172 269 797	1 272 836 749	1 575 821 377	1 749 616 409	1 751 885 955
Distribution	217 681 180	231 773 520	237 287 044	248 674 868	258 564 682	351 321 008	391 069 539	536 667 113	548 069 997	508 323 496	520 567 882	613 840 961
Sub Total	602 539 299	655 899 501	705 961 274	872 815 114	1 025 219 161	1 195 861 471	1 459 264 887	1 708 936 910	1 820 906 746	2 084 144 873	2 270 184 290	2 365 726 916
% increase	11%	9%	8%	24%	18%	17%	22%	17%	7%	15%	9%	4%
% of total expenditure	24%	24%	24%	27%	28%	29%	29%	27%	24%	23%	23%	23%
<b>FUNDS</b>												
Capital Development	0	0	0	0	0	0	0	0	0	0	0	0
Rates and General	147 832 718	157 905 047	169 912 469	189 162 190	357 509 683	477 063 733	395 876 280	448 205 520	498 760 834	548 076 046	659 791 740	715 815 672
Working Capital	99 076 208	121 334 894	149 687 274	90 000 000	258 235 673	290 856 887	413 521 565	427 377 149	721 389 400	710 743 608	748 164 456	809 181 238
Durban Metro	0	0	0	181 914 287	0	0	0	0	0	0	0	0
Sub-Total	246 908 926	279 239 941	319 599 743	461 076 477	615 745 356	767 920 620	809 397 845	875 582 669	1 220 150 234	1 258 819 654	1 407 956 196	1 524 996 910
increase	67%	13%	14%	44%	34%	25%	5%	8%	39%	3%	12%	8%
% of total expenditure	10%	10%	11%	14%	17%	19%	16%	14%	16%	14%	14%	15%
<b>LOAN CHARGES</b>												
Sub-Total	273 858 000	315 325 905	316 056 450	0*	0	0	0	0	0	0	0	0
% increase	-15%	15%	0%	0%	-22%	-9%	17%	12%	3%	1%	2%	-8%
% of total expenditure	11%	11%	11%	0%	5%	4%	4%	3%	3%	2%	2%	2%
Interest Paid	0	0	0	218 808 794	171 542 017	156 036 300	182 419 882	204 605 993	211 132 352	213 076 263	216 737 290	199 105 322
<b>ELECTRICITY PURCHASED</b>												
Energy	1 234 592 321	1 328 370 998	1 348 184 097	1 376 760 971	1 531 383 275	1 637 026 628	2 196 144 780	3 175 088 591	4 009 579 919	5 189 059 165	5 842 651 946	6 314 922 078
Demand	173 807 591	201 826 269	256 148 581	268 764 753	296 218 910	324 328 379	444 662 350	291 658 828	405 010 527	321 432 792	347 654 847	4 779 054
Sub-Total	1 408 399 912	1 530 197 267	1 604 332 678	1 645 525 724	1 827 602 185	1 961 355 007	2 640 807 130	3 466 747 419	4 414 590 446	5 510 491 957	6 190 306 793	6 319 701 132
% increase	9%	9%	5%	3%	11%	7%	35%	31%	27%	25%	12%	2%
% of total expenditure	56%	55%	55%	52%	50%	48%	52%	55%	58%	61%	61%	61%
<b>TOTAL</b>												
Total Amount	2 531 706 137	2 780 662 614	2 945 950 145	3 198 226 109	3 640 108 719	4 081 173 398	5 091 889 744	6 255 872 991	7 666 779 778	9 066 532 747	10 085 184 569	10 409 530 280
% increase	10%	10%	6%	9%	14%	12%	25%	23%	23%	18%	11%	3%



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