CITY OF CAPE TOWN

ELECTRICITY SERVICES DEPARTMENT

BUSINESS PLAN REVIEW 2016/17

A plan submitted in fulfilment of good business practice

City of Cape Town
Utility Services Directorate

Director: Electricity
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Executive Overview

THE LEGAL FRAMEWORK

The Constitution of South Africa Act 108 of 1996

The Constitution was approved by the Constitutional Court on 4 December 1996 and took effect on 4 February 1997. The Constitution is the supreme law of the land under which all laws are framed and under which the operation of municipalities is governed. Municipal powers and functions are dealt with in Section 156 and Schedules 4B and 5B of the Constitution. Electricity reticulation is a Schedule 4B function and the provision of street light is a Schedule 5B function.

Municipal legislation

There is a series of municipal legislation which establishes the legislative framework for local government to exercise its Constitutional powers and functions. These include the Municipal Demarcation Act 27 of 1998, the Municipal Structures Act 117 of 1998, the Municipal Systems Act 32 of 2000, the Municipal Financial Management Act 56 of 2003 (MFMA), the Municipal Fiscal Powers and Functions Act 12 of 2007. Together, these regulate municipal internal arrangements, systems and financial matters and provide for a service authority – service provider arrangement provided through a service delivery agreement.

Legislation specific to electricity provision

The Electricity Regulation Act 4 of 2006 establishes the National Energy Regulator of South Africa (NERSA) and together with the Electricity Regulation Amendment Act 28 of 2007 (Electricity Regulation Second Amendment Bill was published for comment in Notice 905 of 2011) sets the framework under which electricity service providers are regulated in the provision of an electricity service to electricity end users, having regard to good governance, efficiency, effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic. NERSA exercises its authority through electricity distribution licences which stipulate service standards in terms of NRS 047, Quality of Service, and NRS 048, Quality of Supply,

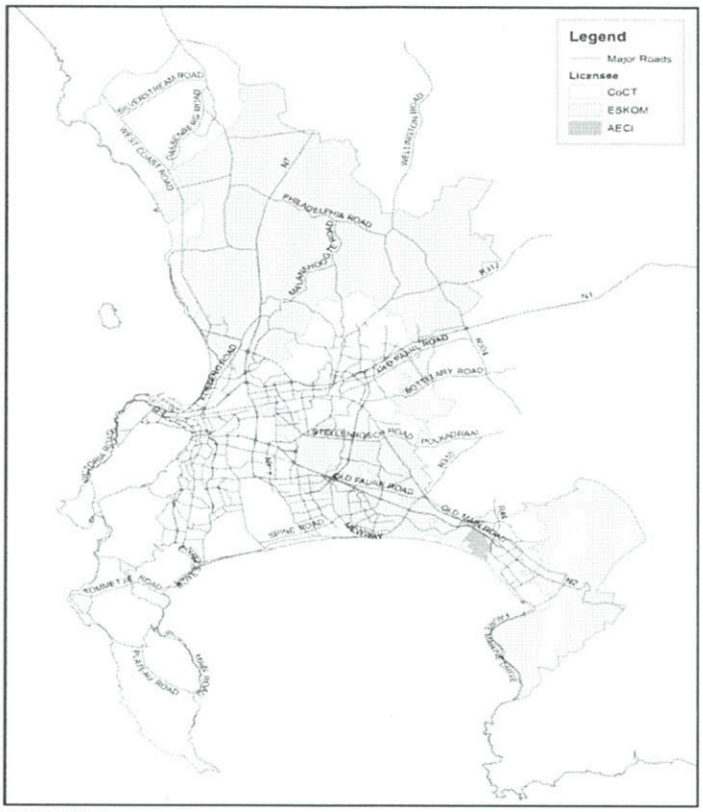
The Electrical Installation Regulations of 2009 and the Electrical Machinery Regulations of 1988, framed under the Occupational Health & Safety Act 85 of 1993, govern respectively the safe use of electricity by users in electrical installations and the environment in which electrical machinery operates.

Municipal By-law

Municipalities, in terms of the provisions set out in the Municipal Systems Act, can pass by-laws for promulgation by the Provincial Legislatures. The City of Cape Town passed the City of Cape Town Electricity Supply By-law of 2010 which was promulgated by the Western Cape Provincial Legislature on 16 April 2010. The By-law regulates the relationship with electricity consumers as well as protects and safeguards the integrity of the electricity network infrastructure to ensure a secure supply of electricity. The By-law is only applicable in the Cape Town area of electricity supply (see below).

ELECTRICITY DISTRIBUTION SERVICES ACROSS THE METRO

The City of Cape Town is the Service Authority for the entire Metro. There are three service providers within the metro although there are no formal service delivery agreements with the service authority. The service providers are the City of Cape Town Electricity Services Department (ESD), ESKOM and AECI, each of which holds an electricity distribution licence for a licenced area of electrical supply issued by NERSA. The licenced areas of electrical supply are shown below. In the case of ESD it is the same legal entity as the City even though it is operated as a financially ring-fenced department within the City. The AECI electricity distribution licence is being transferred piecewise to ESD. Although there is no formal service delivery agreement with Eskom, an agreement for the provision of Free Basic Electricity (FBE) is in place. The South African Local Government Association (SALGA) is addressing with Eskom and National Treasury the putting in place of service delivery agreements.



INDUSTRY CHALLENGES

The Electricity Distribution Industry (EDI) faces a number of immediate and medium term threats which have impact on the ESD. These pose real risks to sustainable service delivery in the medium term. These are:

- Reduction in electricity sales
- Increasing tariffs above CPIX and customer's ability to pay.
- Electricity bulk supply constraints (resulting in possible load shedding).
- Need for investment into infrastructure (new demand and refurbishment).
- Skills shortage.
- Challenges associated with carbon emissions, climate change, energy efficiency, renewable energy and new technologies.
- Increase in vandalism of electricity infrastructure (including copper theft).
- Increase in theft of electricity.

BRIEF HISTORY OF CITY OF CAPE TOWN ELECTRICITY SERVICES DEPARTMENT

The generation and distribution of electricity in Cape Town started in 1882. In 1932 a generation pooling agreement was reached between the City of Cape Town and Eskom (established in 1923). The first temporary bulk supply from Eskom was only taken in 1965, and converted to a 20 year supply in 1971 marking the City's increasing reliance on Eskom for bulk supply of electricity.

The year 2000 saw the creation of the Unicity after almost a decade of local government restructuring. The consolidation of the ESD in its current form from five electricity departments occurred in 2005, after a period of interim arrangements.

Since the mid-1990s the electricity distribution industry (EDI) was the subject of a national restructuring that was aimed at establishing Regional Electricity Distributors (REDs). The City of Cape Town ESD was chosen as the pilot project of the national restructuring, and in July 2005 the first Regional Electricity Distributor (RED1) was established as the authorized service provider for the entire metro. For the period July 2005 to December 2006, both Eskom and the ESD provided services on behalf of RED1. RED1 was dissolved in October 2009 and the EDI restructuring was abandoned in 2011.

Since the early 2010's the City has piloted small scale embedded generation (SSEG) with a focus on renewable energy generation. The City remains a leading player in facilitating the connection of privately owned SSEG and implemented SSEG tariffs in 2014. It is expected that the uptake will increase exponentially as electricity prices rise and the price of SSEG (particularly photovoltaic PV systems) drop.

Contents

Glossary

16/17 Refers to the financial period 1 July 2016 to 30 June 2017

AMI Automated Metering Infrastructure

AMP Asset Management Plan

CAIDI Customer Average Interruption Duration Index

CCT City of Cape Town / Council / Municipality

CGD Capital Grants and Donations

CIP Comprehensive Infrastructure Plan

CRM Customer Relationship Management

CRR Capital Replacement Reserve

DoE Department of Energy

DSM Demand Side Management

EAM Enterprise Asset Management

ECSA Engineering Council of South Africa

EDI Electricity Distribution Industry

EE Energy Efficiency

EFF External Financing Fund

ESC Enterprise Solution Centre

ESD Electricity Service Department (of the City of Cape Town)

FBE Free Basic Electricity

GCAC Grid Code Advisory Committee

HV High Voltage

IDP Integrated Development Plan

IET Industry Expert Team

INEP Integrated National Electrification Plan

IPP Independent Power Producer

IRM Integrated Risk Management

ISU Integrated Solutions for Utilities

LV Low Voltage

MFMA Municipal Finance Management Act 56 of 2003

MTREF Medium Term Revenue and Expenditure Framework

MV Medium Voltage

MYPD Multi-Year Pricing Determination

NERSA National Energy Regulator of South Africa

NRS National Rationalised Specification

OMS Outage Management System

OVS Online Prepaid Vending System

PPA Power Purchase Agreement

RED Regional Electricity Distributor

REIPPP Renewable Energy Independent Power Producer Procurement Programme

ROR Rate of Return (Regulation)

SAIDI System Average Interruption Duration Index

SAIFI System Average Interruption Frequency Index

SAJD Skills Development to Job Description

SALGA South African Local Government Association

SANS South African National Standard

SAP Systems, Applications and Products

SCADA Supervisory Control and Data Acquisition

SHPS Steenbras Hydro Pumped Storage Scheme

SMP Strategic Management Plan

SSEG Small Scale Embedded Generation

TOC Technical Operations Centre

ULM Utility Load Management

USDG Urban Settlements Development Grant

Chapter 1 Network Performance

1.1 Quality of Supply

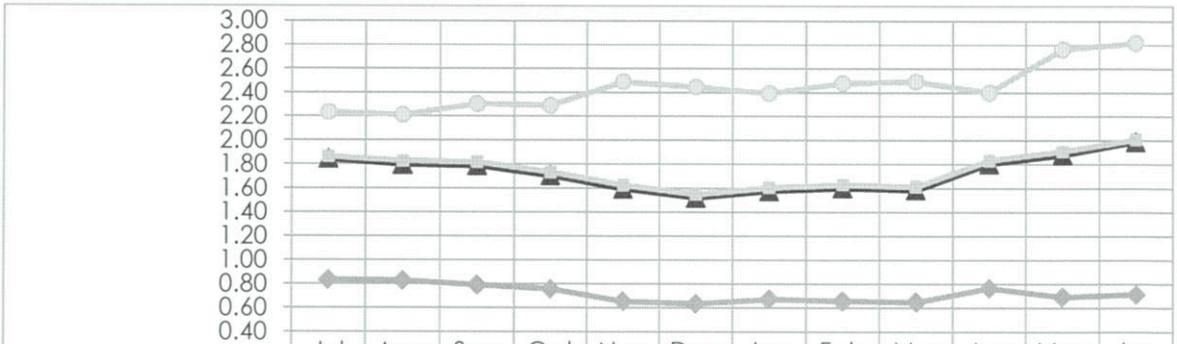
The ESD core business is to provide reliable electricity supply to customers in the ESD supply area. To ensure that the quality of electricity supply meets the required regulatory standards, ESD monitors its performance in terms of NERSA guidelines as set out in the NRS 048 documents.

The measures for network reliability are given below together with the reliability targets:

- CAIDI — customer average interruption duration index, which is the average duration a customer is without power when affected by a supply interruption
- SAIFI — system average interruption frequency index, which represents the average number of interruptions that a customer experiences each year
- SAIDI — system average interruption duration index, which is the average duration that customers are without power each year

Measure	*Target (limits)*	*Units*
Outage time HV & MV (CAIDI)	*2.3*	*Hours*
Outage frequency HV & MV (SAIFI)	*1.3*	*Number*
Outage duration HV & MV (SAIDI)	*3.0*	*Hours*
Outage duration MV (SAIDI)	*2.2*	*Hours*

Interruption performance SAIDI, CAIDI and SAIFI Graph for the year ending June 2015



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
SAIFI (MV+HV)	0.83	0.83	0.79	0.76	0.65	0.63	0.67	0.66	0.65	0.76	0.69	0.71
SAIDI (MV)	1.84	1.80	1.79	1.70	1.59	1.52	1.57	1.60	1.58	1.80	1.88	1.99
SAIDI (MV+HV)	1.86	1.83	1.82	1.73	1.62	1.55	1.60	1.63	1.61	1.83	1.91	2.01
CAIDI (MV+HV)	2.23	2.21	2.30	2.29	2.49	2.44	2.39	2.48	2.49	2.40	2.76	2.82

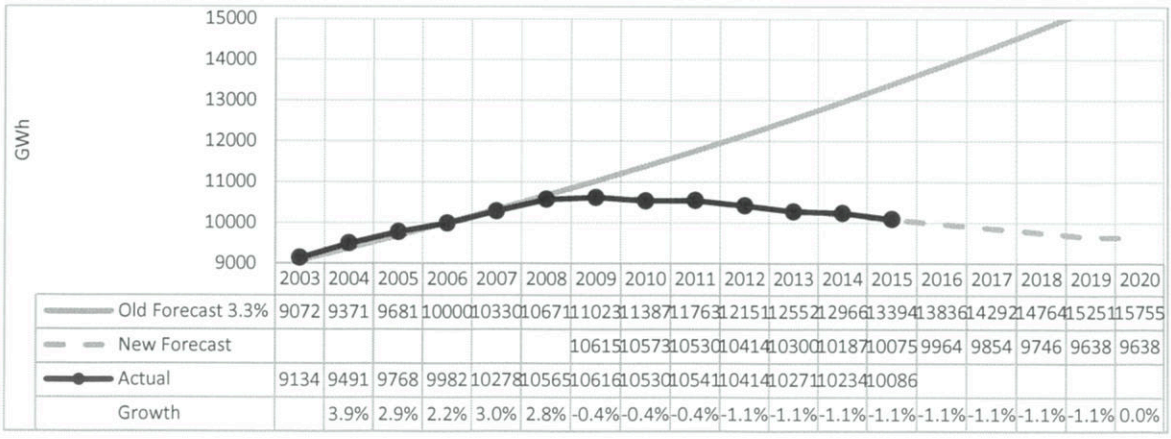
The SAIDI reported is the MV SAIDI and MV plus HV SAIDI. The Bulk events such as load shedding by Eskom and other Bulk supply in-feed and major events are excluded in these figures above, as the ESD has little or no control over these.
Voltage dip performance is another important indicator of quality of supply. Below is the HV dip performance table for 12 months. This shows our network performance when compared to the characteristic values as provided by the NRS 048-2:2006 for X1, X2, S, T, Z1 and Z2 type dips. ESD customers experience significantly less dips than the national average. The table below defines the dip categories in terms of duration, depth and the characteristic values of voltage dips per annum for (50% of sites) per NRS 048-2. For example the above information should be read as follows: 50 % of the sites monitored nationwide experience 13 or less X1 dips.

HV Dip performance table for the year ending June 2015

Category	*Duration (millisecond)*	*Depth*	*National Characteristic values*	*CCT Characteristic values*
X1	*> 20 ms to 150 ms*	*30 % to 40 %*	*13*	*2*
X2	*> 20 ms to 150 ms*	*40 % to 60 %*	*10*	*3*
S	*> 150 ms to 600 ms*	*20 % to 60 %*	*7*	*0*
T	*> 20 ms to 600 ms*	*60 % to 100 %*	*5*	*1*
Z1	*> 600 ms to 3 s*	*15 % to 30 %*	*4*	*0*
Z2	*> 600 ms to 3 s*	*30 % to 100 %*	*1*	*0*

1.2 Electricity consumption and demand growth in the ESD Supply Area

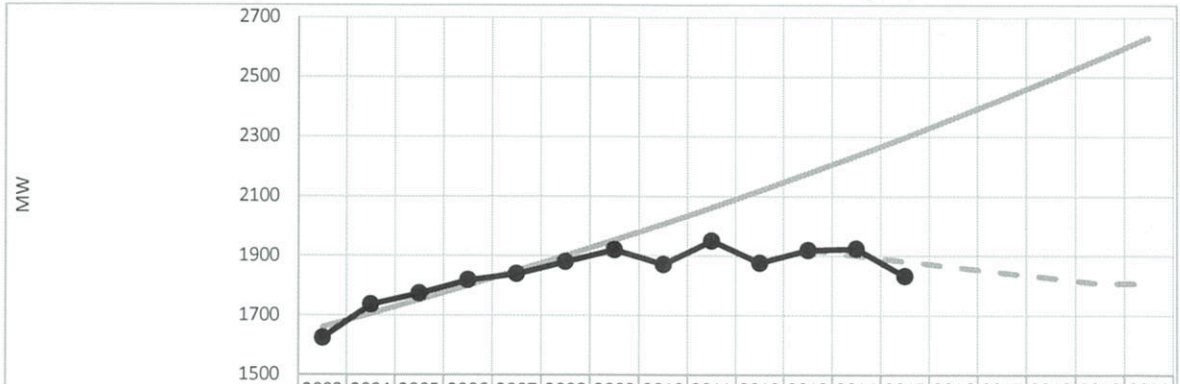
The Graph below indicates the effects of the energy efficiency programmes, electricity pricing and the recessionary effects in the ESD area of supply. The old forecast on this graph indicates the energy consumption that the CCT should be experiencing at a constant growth of 3.3%. The average energy growth experienced in the ESD for the 6 years July 2000 to June 2006 was 3.3% p.a. Actual growth since 2008/09 was negative and the forecast, shown as dashed lines in the graph below, is expected to remain negative.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Old Forecast 3.3%	9072	9371	9681	10000	10330	10671	11023	11387	11763	12151	12552	12966	13394	13836	14292	14764	15251	15755
New Forecast							10615	10573	10530	10414	10300	10187	10075	9964	9854	9746	9638	9638
Actual	9134	9491	9768	9982	10278	10565	10616	10530	10541	10414	10271	10234	10086					
Growth		3.9%	2.9%	2.2%	3.0%	2.8%	-0.4%	-0.4%	-0.4%	-1.1%	-1.1%	-1.1%	-1.1%	-1.1%	-1.1%	-1.1%	-1.1%	0.0%

Similar trends to the energy graph above can be seen in the system demand graph. There was a sharp drop in demand growth in 2009/10 compared to the historic

system demand growth of 2.7 %. Demand growth is more weather dependant than energy growth and has greater fluctuations. The demand growth is expected to fluctuate by 2 % around the dashed forecast line shown in the graph below.

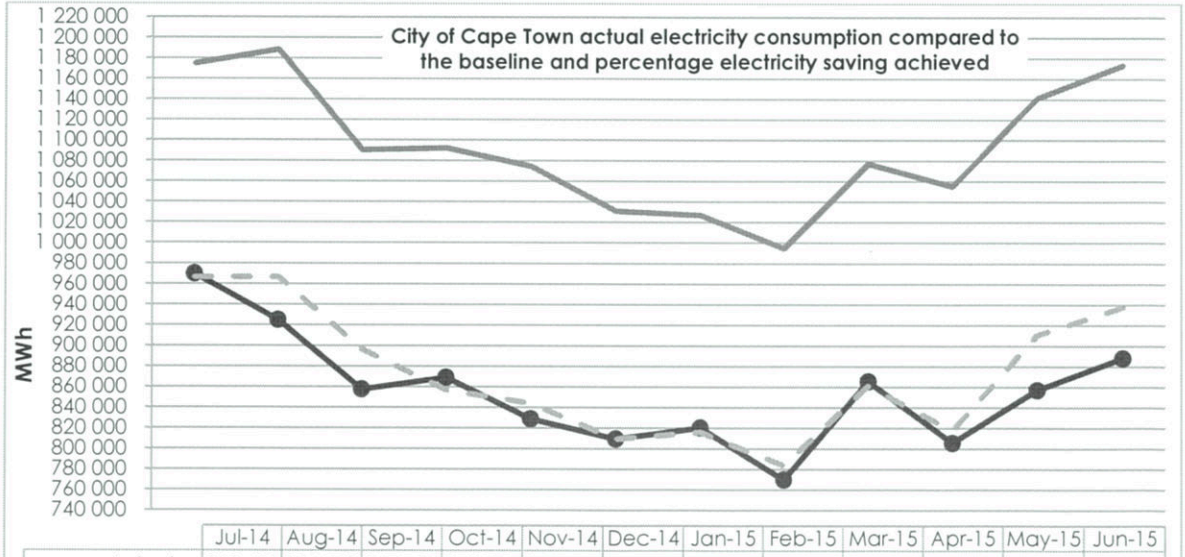


	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Old Forecast (2.75%)	1660	1705	1752	1800	1850	1901	1953	2007	2062	2119	2177	2237	2298	2361	2426	2493	2562	2632
New Forecast											1920	1901	1882	1863	1844	1826	1808	1808
Actual Max Demand	1623	1736	1773	1818	1839	1880	1920	1871	1950	1876	1919	1924	1832					
% growth	0.5%	6.9%	2.1%	2.5%	1.1%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	0.0%

1.3 Electricity Demand and Supply

Electricity Savings

Since the call to save 10% in energy consumption, actual consumption compared to growth forecast has been reported graphically as shown below. Since 2008 the objectives were met with the "savings" exceeding 10%.



	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15
Actual	969 651	924 705	857 407	868 797	828 663	809 269	820 185	769 774	865 178	805 557	856 928	887 951
Baseline	1 174 8	1 188 4	1 090 4	1 092 3	1 074 3	1 030 9	1 026 9	994 593	1 077 0	1 055 2	1 141 3	1 173 1
2006/7	966 230	966 673	896 343	856 572	843 598	809 106	815 724	783 623	860 967	817 387	910 370	937 688
% Saving	17.5%	22.2%	21.4%	20.5%	22.9%	21.5%	20.1%	22.6%	19.7%	23.7%	24.9%	24.3%

Renewable Energy

In accordance with the City's draft Energy and Climate Change strategy, the Department aims to promote the use of renewable energy as follows:

- Sell the Green Electricity purchased by the City of Cape Town from the Darling Wind Farm. This was South Africa's first commercial wind farm comprising four 1.3MW turbines and began generating in May 2008. This operating model has been replaced by the National Renewable Energy Independent Power Producer Procurement Programme (REIPPP) since 2012.
- Promote and facilitate the implementation of other renewable generation systems where practical.
- To keep abreast of national and provincial developments regarding renewable energy and facilitate the incorporation thereof into City processes.
- To investigate the practicality of entering into long term Power Purchase Agreements (PPAs) with Independent Power Producers (IPPs) to provide electricity at the same price the City purchases electricity from Eskom.
- Manage the City's SSEG program which provides for a limited amount of excess generation of small scale renewable energy generators to be fed back onto the municipal grid and to receive an associated credit.
- Promote the finalization of national technical specifications for the connection of small scale renewable generation to utility electrical grids.

Demand Side Management / Energy Efficiency

In partnership with the Environmental Resource Management Department, the Department aims to:

- Establish and implement an Energy Efficiency (EE) programme.
- Promote Eskom's Energy Saving Program to the City's electricity consumers.
- Establish and maintain an on-line EE and Demand Side Management (DSM) resource.

The Department completed pilot projects for smart prepayment meter and a Utility Load Management (ULM) to test and assess the appropriateness, uses and availability of technologies for smart meters and improve service delivery. The results will be used to inform a decision on whether to deploy these technologies for use in the business.

Load Shedding

The ESD is ready to respond to a national declared emergency and activate load shedding in accordance with the national requirements and the published load shedding schedules. Load shedding in the event of a system emergency is required in order to prevent the power system from sliding into an unstable state which can lead to a national blackout with serious consequences.

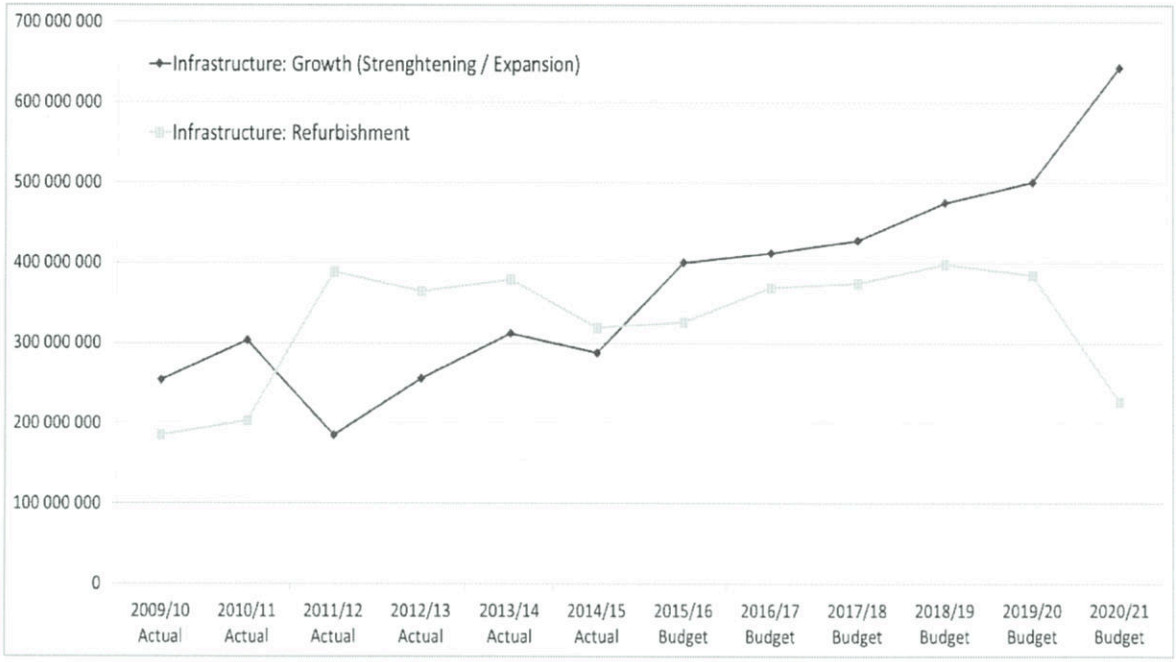
The City's load shedding practices and schedules have been aligned with the national standard NRS048 part 9. Load-shedding schedules are posted on the City of Cape Town official website.

Chapter 2 Network Infrastructure

2.1 Network Infrastructure and Development

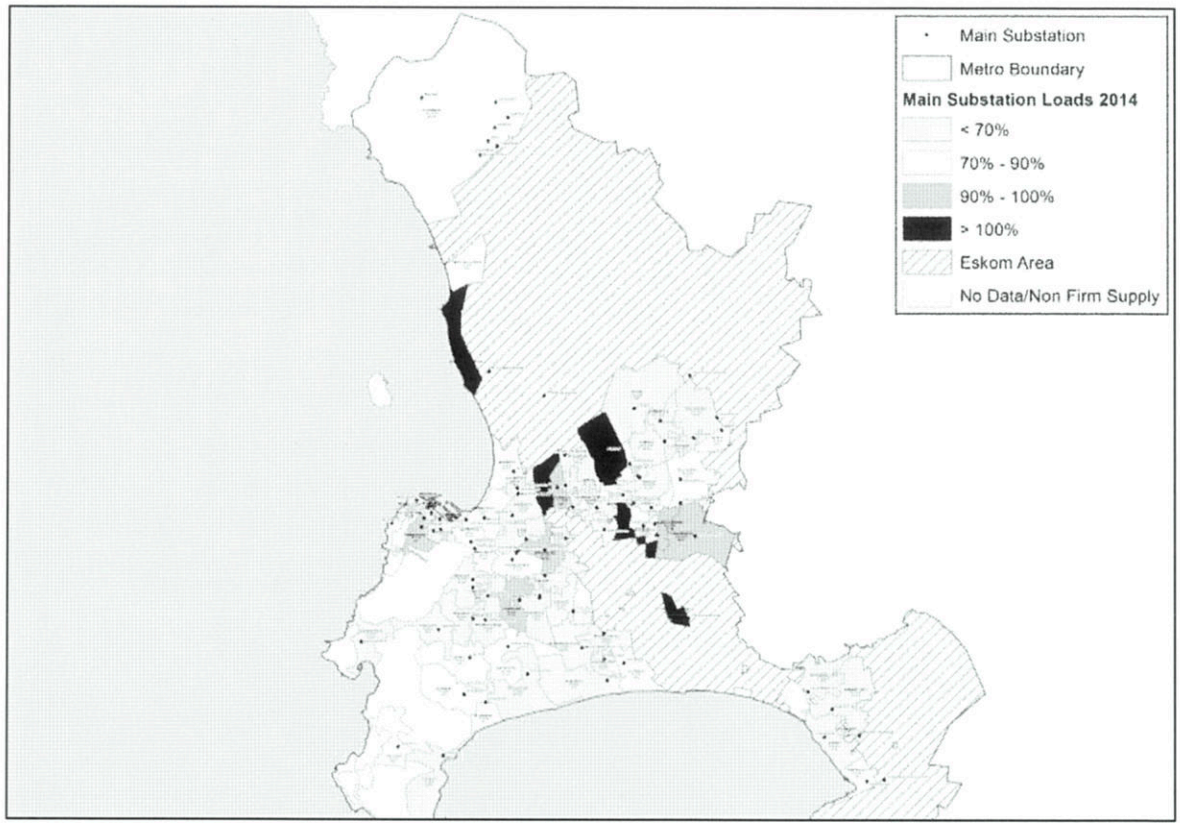
The ESD electricity distribution network is categorized into High Voltage (HV), Medium Voltage (MV) and Low Voltage (LV) networks. An 18-year HV development plan is maintained. Medium term (5-year) MV and LV development plans are be developed as part of the Asset Management Plan (AMP) or Comprehensive Infrastructure Plan (CIP).

Within the geographical area of Cape Town a backlog exists in refurbishment of infrastructure. The backlog will continue to be financed through internally generated funds and external loans. The current infrastructure needs to be refurbished and maintained to ensure that the condition of the current networks and infrastructure is improved to meet the business and social challenges in electrification in South Africa. The City's investment into refurbishing and growing the network is shown below.



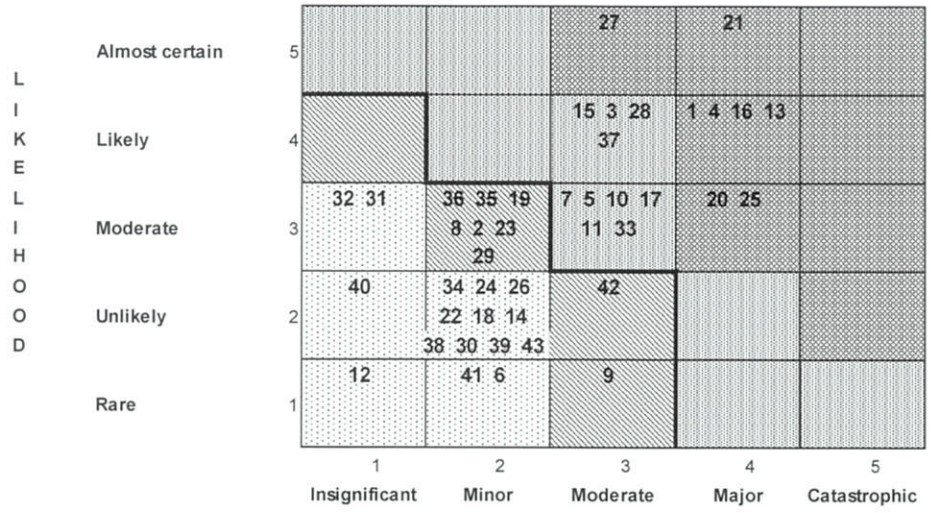
2.2 HV Capacity and Main Sub Station Loading

The loading relative to the design capacity of each main substation, both in the City's and in Eskom's area of supply is shown in the map below. Loading is one of the factors taken into account in prioritising capital projects.



2.3 High Voltage Distribution Network Infrastructure Plan

Capital projects are evaluated and graded on a risk matrix. The likelihood of having an impact and the severity of the impact on the ability to distribute power were evaluated and plotted on the graph below. The number on the matrix refers to the listed project.



5 YEAR TRANSMISSION SYSTEM IMPLEMENTATION PLAN

NOTE: Projects should be implemented before the risk profile exceeds a moderate risk as indicated by the solid line

Key to Risk Assessment:

Extreme risk | High risk | Moderate risk | Low risk

21	Mitchells Plain Intake Integration
1	Athlone - Philippi: OHL Line Undergrounding
4	City 33kV Gas Cable Replacement
16	HV Switchgear Replacement
13	Grassy Park HV Rearrangement
20	Main Substation MV Switchgear Replacement
25	MV Circuit Breaker Replacement
27	Mitchells Plain - Steenbras 132kV OHL Loop-in
15	Gugulethu Upgrade
3	Newlands Upgrade
28	Oakdale Upgrade Phase 2
37	Stikland Main Substation
7	Broad Road Phase 3
5	Bofors Upgrade
10	Durbanville Phase 2
17	Koeberg Road Switching Station Phase 2
11	Eversdal - Durbanville OH Line Upgrade
33	Plattekloof - N1 Reinforcement
42	Grosvenor Upgrade
9	Philippi - Rosmead Ave cable Replacement
36	Oakdale Upgrade Ph 3
35	Melkbos Main Substation
19	Langverwacht Upgrade
8	Bellville South Main Substation Upgrade
2	Atlantis Industrial Main Substation
23	Mowbray Main Substation
29	Observatory Upgrade
34	Monte Vista Main Substation
24	Muizenberg Ph3
26	Eastridge Upgrade
22	CBD Main Substation
18	Montague Gardens Reinforcement
14	Grassy Park Upgrade
38	Tamboerskloof Transformer Replacement
30	Haasendal Main Substation
39	Tygerberg Hospital Reinforcement
43	Stellendale Main Substation
41	Sampson Upgrade
6	Briers Substation
32	Heartland Ph 1
31	Oakland City Ph 1
40	Rondebosch Main Substation
12	Firlands Main Substation Phase 1
44	Transwerke Main Substation
45	Culemborg Main Substation
46	Westcape Main Substation
47	Ysterplaat Main Substation
48	Wingfield Main Substation

2.4 Management of Legacy MV Switchgear

The City faces serious challenges in the management and maintenance of equipment on the MV distribution system due mainly to ageing infrastructure. These challenges are put in stark relief by the increasingly rigorous international standards in distribution switchgear design and safety. This applies to all forms of MV switchgear on the system.

Legacy switchgear does not comply with current international safety standards (IEC 62271-200) and system fault levels exceed switchgear capability in many cases, posing a substantial risk to operating personnel and system reliability. The current focus is specifically on the indoor "Metal-clad" primary switchgear but secondary and outdoor oil-insulated switchgear that is assessed to present a specific safety risk is also being replaced with modern gas insulated switchgear as required. The replacement and refurbishment programmes for the Metal-clad switchgear in the distribution network will run for some years yet before all legacy switchgear has been addressed. Focused maintenance, refurbishment, replacement and upgrade programmes for the MV switchgear in main substations have been put in place. Before these programmes were initiated, approximately 6 300 switch panels were in service, the majority being obsolescent (25% more than 50 years old, 30% between 30 and 50 years old). Some 320 of these 6300 panels have been replaced in the last three financial years and a further 1500 have been refurbished to a suitable standard through switch-panel upgrades and retrofit with modern circuit breakers.

2.5 Electricity Enterprise Asset Management

In 2006 NERSA conducted technical audits of major electricity distributors including the ESD in which maintenance was highlighted as a major area of concern. Subsequent to this ESD has embarked on a multi-year programme to implement enterprise asset management (EAM) using the SAP platform and conforming to PAS55 standards. Through the systematization, standardization and centralization of functions asset management will form an integral part of day to day activities to create an efficient, predictable operational environment.

With the transfer of assets from the legacy systems to SAP, not enough time was spent on implementing a comprehensive AMP. The main focus was on financial systems which resulted in a lack of operational focus. Physical asset master data was extremely limited and of poor quality. This led to the need for a total rebuild of SAP EAM (SAP PM – Plant Maintenance Module – and related modules) and to collect and populate asset master data. This work is in progress, with a new master data design and data collection having been completed for distribution MV and LV, but will take some time yet before it is completed for all ESD physical assets, including Facilities, Generation and secondary functions. The current focus is on the HV master data design. Full operationalization will take place in the medium term.

As a result of the historic system deficiencies the organizational deficiencies and behaviours have been perpetuated. The operationalization will require fundamental

changes to the way business is currently conducted and a significant effort in organizational realignment and change management will be required to achieve success in EAM. Organizational culture change will be one of the biggest challenges to smooth implementation.

A big drive is the optimisation of workforce management and utilisation using a mobile platform. As part of the EAM continual improvement, the maintenance business processes are being standardised and successively rolled out for mobile application. Thus far MV inspection and first Line Response is being executed using mobile devices in the field. Roll out of LV inspections is in progress.

As ESD is leading the EAM initiative with the other infrastructure driven departments following, partnering with the Enterprise Solution Centre (ESC), Human Resources (HR) and other Directorates for a successful implementation of EAM is of corporate importance.

One of the major challenges is the standardisation of equipment specifications and work is in progress to align ESD standards to national and international standards as well as to incorporate design elements to combat the ever increasing levels of vandalism. Equipment technical specifications are in the process of being enhanced to take cognisance of full asset lifecycle content requirements, including the anticipated spare parts requirements and inclusion of the provision thereof, technical user training and the provision of maintenance and operating manuals as well as drawings.

Changes in Supply Chain related legislation have forced a reconsideration of ESD's interaction with CCT Supply Chain Management and work has begun with the aim of standardising ESD tenders and developing a centre of expertise and standardisation for tenders, with particular focus on the format and legal compliance. Tenders previously written and contract managed by a wide variety of technical staff throughout ESD units are being centralised under the auspices of EAM, either in the form of complete tender responsibility or, in some cases, by the provision of oversight with regard to structure and legal compliance. The technical content of the tenders will still be vested in the people with the relevant technical expertise where that expertise resides outside EAM.

2.6 Distribution Grid Code Compliance

In 2012 ESD undertook a self-assessment of Distribution Grid Code compliance. The assessment was reviewed by the NERSA Grid Code Advisory Committee (GCAC) in October 2012. According to NERSA, "the responses given by Cape Town under this code were satisfactory and show that although on some of the clauses there can be improvements, the minimum requirements are met."

A number of exemptions were applied for and the GCAC recommended them for approval by NERSA. A few were referred to the Industry Expert Team (IET) for further

interrogation. One was recommended for exemption by NERSA, while for others the IET recommended a revision of the specifications governing them. One of the exemptions was deemed unnecessary as the clause that prompted it requires interrogation at a policy level. The IET recommended that this be referred to the DoE for policy formulation. These decisions are set out in the Table below.

NERSA Ref. No.	Code	GCAC Decision
1. 2012DCEX002	Metering code	Accepted for NERSA approval
2. 2012DCEX003	Metering code 4.2.1 & 4.3.1	Accepted for NERSA approval
3. 2012DCEX004	Metering code 4.3.2	Accepted for NERSA approval
4. 2012DCEX005	Metering code 4.5.4	Accepted for NERSA approval
5. 2012DCEX006	Metering code 4.8.1	Accepted for NERSA approval
6. 2012DCEX007	Metering code 4.1.1	Accepted for NERSA approval
7. 2012DCEX008	Network Code 3.2(6)	Accepted for NERSA approval
8. 2012DCEX009	Network code 4(2)I	Accepted for NERSA approval
10. 2012DCEX011	Network Code Clause 6.4(3)	Proposed that Cape Town explain in detail this deviation from SANS, why and how has it deviated etc. Submission referred to the IET for more deliberation and interrogation.
11. 2012DCEX012	Network code 7.1	Accepted for NERSA approval
12. 2012DCEX013	Network Code Clause 7.2.1(4)	Agreed with the exemption for large investments but was unclear for smaller investments. Application referred to the IET, where City of Cape Town has to present their practices on smaller investments.
13. 2012DCEX014	Network code 7.2.1(6)	The GCAC agreed that in the absence of NERSA's process for determining either (a) the discount rate or (b) the customer interruption cost (CoUE), there is no need for exemption. NERSA to develop the framework for CoUE and communicate accordingly with the industry
14. 2012DCEX015	System Ops Code 5.2	Accepted for NERSA approval
15. 2012DCEX016	System Ops Code 6.3	Accepted for NERSA approval
16. 2012DCEX017	Tariff Code 6.0	Mr B. Magoro of the DoE raised that this is a policy issue and needs to be tackled at that level. No need for exemption.

Chapter 3 Operations

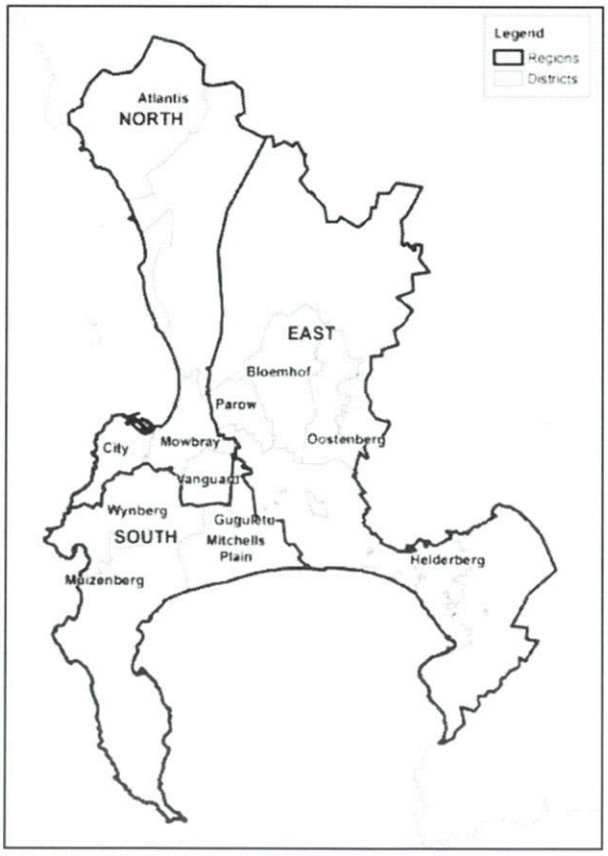
3.1 Access to Electricity Service

Access to electricity service is achieved through the demand driven capital programme funded through developer's contributions for non-subsidized housing. Subsidized housing is funded by grant funding via the electrification plan (see 3.7). The expenditure and budget for developer's contribution and private sector expenditure is given below:

Developers Contributions & Private Sector - Actual and Budget												
Year	2009/10 Rm	2010/11 Rm	2011/12 Rm	2012/13 Rm	2013/14 Rm	2014/15 Rm	2015/16 Rm	2016/17 Rm	2017/18 Rm	2018/19 Rm	2019/20 Rm	2020/21 Rm
Budget	125,5	83,3	68,0	79,0	74,6	76,5	84,4	94,9	100,1	105,2	109,9	115,3
Actual	115,2	80,3	65,7	70,3	69.5	72,2	-	-	-	-	-	-

3.2 Electricity Distribution / Service Areas

Electricity Distribution is provided via three Regions (Service Areas), each having four Districts. Each District is responsible for maintenance, non-remote operations, and minor construction and operates out of a District office located in the District.



In the medium term, the construction of a new District office at Westlake (to replace the one at Muizenberg) and the relocation of the City District office to the new Electricity House – City in Bree Street is planned. The move to Electricity House - City will allow for the redevelopment of the Hudson Street quarry site. With the ever

expanding metropolis, satellite district offices are planned for Hout Bay and Fish Hoek and the construction of dedicated street lighting facilities in Bothasig and Blue Downs to service the Eskom areas of supply. The consolidation of Network Control and the upgrading of store and other facilities at Bloemhof are also planned.

3.3 Electricity Retail Management

This branch is structured based on SAP ISU – Integrated Solutions for Utilities module – functionality and is responsible for customer services including the Technical Operational Centre (TOC), Revenue Protection, Revenue Management, Vending Services and Measurement.

The TOC receives calls from customers on the City's centralised contact telephone number (0860 103 089) and generates works notifications which are electronically sent to the relevant Distribution Area for the First Line Response teams to be dispatched to respond to the complaint. The City of Cape Town's Corporate Call Centre handles calls of a financial (back office) nature. The TOC operates 24 hours, 7 days a week. Besides being able to contact the TOC via the normal telephonic exchange, it is also contactable via the following communication channels:

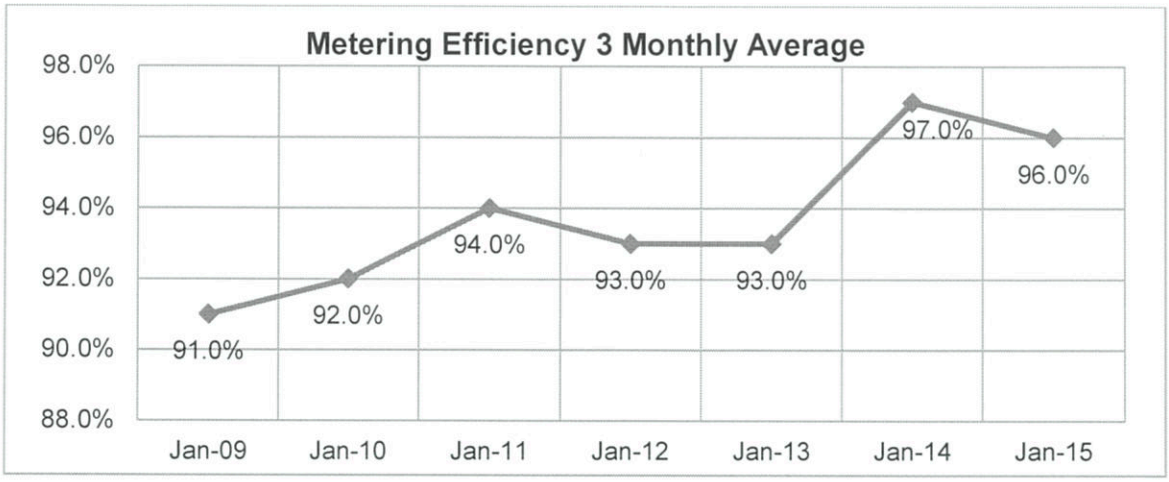
- Tel: 0860 103 089
- SMS: 31220;
- Fax: 086 576 2740; and
- Email: power@capetown.gov.za

The City has approximate 520 000 electricity prepaid customers. The Online Prepaid Vending System (OVS) ensures that all these customers are able to purchase prepaid electricity via internet, cell-phone, ATM/AVM, Point-of Sale outlets and scratch cards. As part of the ongoing enhancements on the OVS an upgrade currently underway is the integration of the prepaid vending system and SAP for the meter-change process. This will consist of an automated process that updates SAP periodically once the prepaid vending system has been updated. This will ensure customer technical data is always accurate and a seamless debt collection process.

The next upgrade consists of integrating the Vending system to SAP CRM - Customer Relationship Management module – which would eliminate the need for a customer database in the Vending system. A major overhaul of the vending system will be required when STS (Standard Transfer Specification) introduces the 13 digit prepaid meter number.

The Revenue Protection section is responsible for the management of the Department's key customers, being the large power user and time-of-use customer base. Special attention is given to these customers who provide a large percentage of the Department's revenue. The Branch also has a dedicated unit which detects and corrects cases of meter bypassing and tampering, which action is followed by recovery of revenue for electricity used and for which no payment has been received.

The Revenue Management section is responsible for Electricity meter reading, the billing of invoices and carrying out credit control and debt management actions. Electricity has some 136 000 conventional meters which are read both In-house and by Contractors with the NRS requirement that 95% meters are read 3 monthly on average. The move to prepaid meters for domestic customers and to Advanced Metering Infrastructure (AMI) metering for large commercial and industrial customers, together with a number of data clean-up exercises has contributed to an improvement in this indicator.



The Measurement section is the technical hub for all meter related Standards, policy, specification and guidelines. The operational tasks includes Support (meter testing, verifications, investigations quality assurance), Automation (Advanced metering infrastructure and Metering Data Unification System) and Operations (Construction, Large Power User and Meter-rooms and Project Management)

The Minimum Standards and Reporting Lines for the Quality of Service of Electricity Supply to customers were published as a standard document, namely NRS 047 Part 1 and Part 2. These specifications cover a number of services including customer driven Complaints, Enquiries, Requests, Quotations and Forums. The standard response times and satisfaction indices for counter services, telephonic replies and written replies are stipulated in these documents.

3.4 Energy Supply

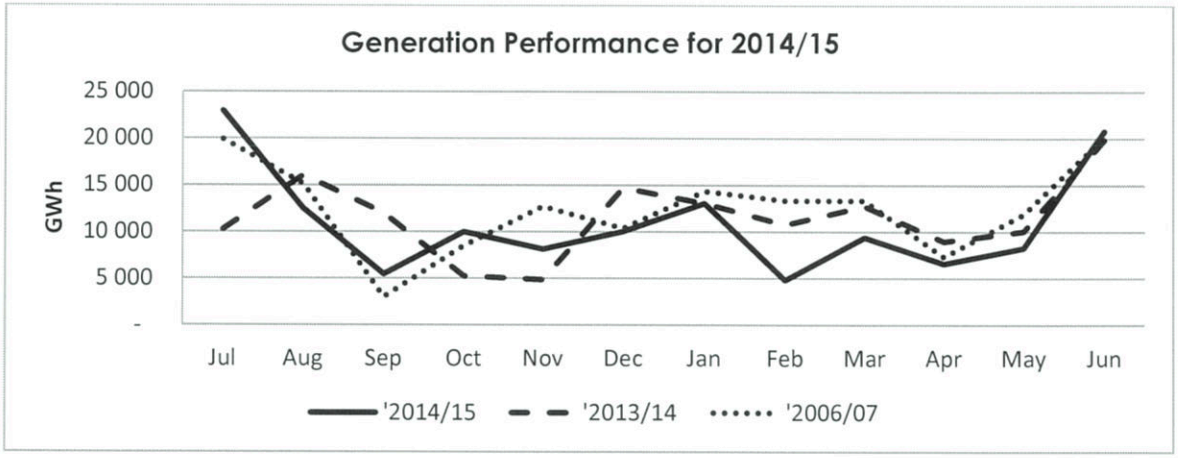
This branch consists of Network Control, SCADA Services, Generation and Green Energy. Network Control manages the operations of the network and the supply of energy to the end consumer. They also regulate switching instructions for maintenance crews on planned and unplanned maintenance functions. SCADA Services provides the tools required by Network Control to perform their function.

The Newlands and Bloemhof Control Centres are to be consolidated into one new Control Centre to be located within the Bloemhof Electricity Complex. As part of the

Emergency Preparedness Plan, the existing Control Centre facility at Newlands will be retained as a back-up Control Centre.

ESD is implementing a fully integrated Outage Management System (OMS). ABB/Ventyx has been contracted to supply, install and commission the OMS by the end of March 2016. The system will ultimately provide benefits such as automated fault location, customer feedback, crew & workflow management as well as accurate reporting on SAIFI/CAIFI indices. The Supervisory Control and Data Acquisition / Distribution Management System (SCADA / DMS), installed in 2007, was upgraded in 2014 with revised hardware and the latest version of the system.

Generation manages maintenance and operations of the City's generating facilities and despatch these units as required by Network Control. The City's power stations (Steenbras Hydro Pump Storage [SHPS], Athlone Gas Turbine and Roggebaai Gas Turbine) play the important role in regulation of the maximum demand to meet the set monthly supply target. The performance of the City's generating facilities is shown below.



The project to refurbish SHPS generators is planned to start in 2016. The refurbishment is expected to improve reliability and performance of the station and extend the operating life by a further 40 years.

Decommissioning of the non-operational Athlone coal power station is expected to resume in the 2016/17 financial year and continue until 2020/2021.

3.5 Health, Safety and Environment

Electricity Services is committed to conducting its operations in a manner that is without undue risk to the health and safety of its employees, visitors, public, contractors and the environment. OHSAS 18001 has been rolled out and accreditation has been obtained by a number of branches with the objective to obtain departmental accreditation by 2018.

3.6 Public Lighting

The Public Lighting function is integrated with LV operations within the 3 service areas. For areas North and South it is managed from a central point while in East it is managed at Depot level. Within the Eskom supply area, the conventional street lighting function is performed by a separate Public Lighting section currently based at Ndabeni. This section also operates and maintains the majority of the High Mast Lights located in township developments. The Public Lighting design, specifications and procurement is a separate section within the Engineering division and located at Bloemhof.

There are plans in place to move the Public Lighting section (Eskom areas) closer to the location of geographical service requirement. The first such move will be the new depot in Bothasig with one in the Bluedowns area to follow.

3.7 Electrification Plan

The electrification plan aligns with the Integrated Human Settlements Framework of the City Of Cape Town's IDP. New housing developments are normally serviced, including the provision of electricity, by the developer with these service costs being recovered from the homeowner. In the case of housing developments which consist of dwellings for which the beneficiaries are eligible for Government housing subsidies, the provision of electricity is subsidized via the Integrated National Electrification Plan (INEP) or Urban Settlements Development Grant (USDG) funding. The result is that the City achieves a 100% electrification rate for formal housing developments.

A lack of service connections however exists in the electrification of informal settlements in some areas and in the electrification of backyard dwellers in formal areas. Although the same service level as for formal households is provided to informal households, certain informal areas are excluded from the electrification programme as dwellings are below the 50 year flood line, are in road, rail and power line reserves and servitudes or on privately owned land.

At this stage the bulk of these are found in the portion of the Metro which is in the Eskom area of supply. With a change in the DoE policy, Eskom have embarked on the electrification of informal areas which comply in terms of the City's electrification policy utilizing INEP grant funding. The City has also allocated USDG grant funding aid funds sourced internally by the Electricity Services to fund electrification in informal settlements.

Electrification is an on-going process which follows the Human Settlements Programme and will therefore continue over the medium to long-term.

3.8 Vandalism of network infrastructure and public lighting

Vandalism of network infrastructure and public lighting is sharply on the increase, resulting in a disruption of and an increase in the cost of electricity services. Although various measures for combating vandalism have been rolled out, the scale of the problem, particularly in high incident areas, has resulted in instances of extensive

service disruption and serious safety concerns for staff and public alike. ESD together with other departments are committed to combatting this scourge.

Chapter 4 Support

4.1 Strategic Management Plan and Integrated Risk Management

A strategic management plan (SMP) is developed to ensure implementation of the business plan and is reviewed on an annual basis.

Key multi-year business improvement initiatives identified and implemented as part of previous SMPs include:

- Implementation of EAM structure
- Standardization of Districts based on EAM measured workload.
- Implementation of Outage Management System (OMS)
- Structuring of Electricity Retail Management based on SAP-ISU functionality
- Development of a facilities master-plan to support business growth

Based on the implementation of these initiatives, the following areas have been identified for future focus:

- Implementation of mobile technology for operations
- Introduction of workflow and workforce management systems
- Need to assess current model of departmental and corporate support services including stores and tender management

Other projects identified for prioritization include:

- Future development of the Erica Switching Station
- Inclusion of the AECI supply area into the City's licenced area of supply
- Supply area rationalization between Eskom and the City

The ESD together with a number of partner departments and organizations has participated in work-shopping responses to the electricity distribution industry challenges. These will be carried through to the development of medium term strategy as part of the 2017-2022 IDP. In addition, a number of projects have been identified under the following themes:

- Reducing purchase costs
- Energy Cost curtailment
- Energy Cost curtailment for poor households
- Future funding & service models

ESD will be responsible for driving or participating in these projects together with partner organizations as part of the 2017-2022 IDP and business plans.

The City is obliged to implement risk management in terms of the MFMA and the King II Code on Corporate Governance. In terms of the MFMA, section 62(1)(c)(i) the

accounting officer is responsible to maintain effective, efficient and transparent systems of financial and risk management and internal control. The Department participates in the City's Integrated Risk Management (IRM).

4.2 Human Resource Plan

Staffing Strategy

The ESD staffing strategy is based on expanding the apprentice training program, continued assistance in terms of bursaries to electrical engineering university students in conjunction with our Graduate Internship program and ongoing staff development in line with the needs of the business. The Graduate Internship program has been registered with the Engineering Council of South Africa (ECSA) under Commitment and Undertaking Number CU2011006P to train pupil engineers. Technicians in specialised areas are recruited via a Learner Technicians Project which allows for the business to assess the potential of the individual in these areas of expertise and creates the opportunity for the learner technician to fulfil their academic conditions of practical training in order to graduate.

Training & Skills Development

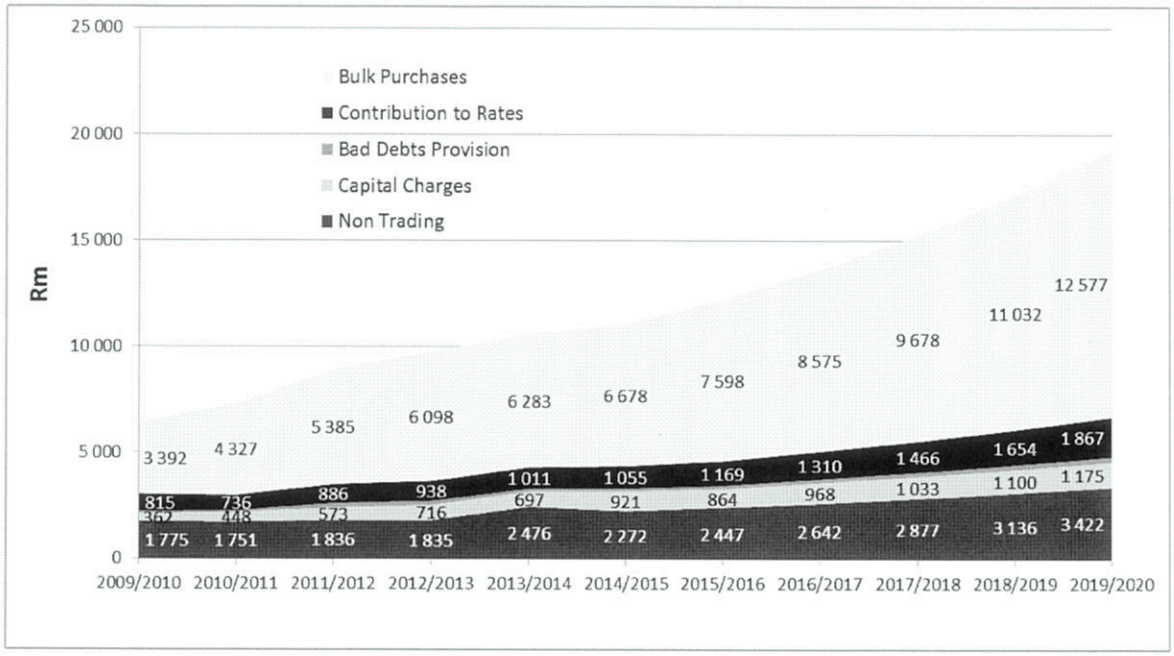
The apprentice training program is run in-house to allow for in-house training skills development to ensure repeatability and has moved to the new Electricity training centre in Brackenfell. This is complimented by a Learner Technicians' Training program and a Learnership program commencing at AET level 3 and continuing through to NQF 4.

Skills Programme training is linked primarily to the Work Place Skills Plans and Skills Development to Job Description (SAJD) program where the throughput of learners on these various programs average 2500 interventions per year. An SAJD model has been developed for all the job designations within Electricity Services with the core elements of the model being that employees are able to perform their job functions competently and safely.

4.3 Financial Plan

Annual review of 3 year budget

The budget presented is based on a combination of zero as well as parameter based budgetary methods. The planned change is premised on the framework that will allow the Finance function to add value to the business it serves. The financial plan is cognitive of the key cost drivers shown in the figure below:



Unless otherwise stated, financial modelling will be based on the assumptions as listed below:

- Contribution to Rates Account = 10% of Electricity Sales (excl FBE)
- System energy growth calculation based on recent and current energy consumptive patterns
- CPIX as determined by Corporate Finance for the next three years
- Effective Eskom increase based on NERSA approved multi-year pricing determination
- Collection ratio of 98% for the next three years

Funding of Capital Budget

The capital funded from a number of funding sources with the Capital Replacement Reserve (CRR), External Financing Fund (EFF) and Grants & Donations (CGD) being the largest. It is critically important that a benchmark for the investment in refurbishment is established in accordance with international best practice to ensure good quality of supply and excellent customer and delivery service.

EFF envelopes are set by Corporate Finance and increases in capital charges related to this funding source have an impact on tariffs. With effect from the 2014/15 financial year, non-generating revenue projects in respect of infrastructure and refurbishment have been moved from EFF (loans) to CRR (revenue) funding. This practise over an extended period will have the effect of reducing tariff increase requirements.

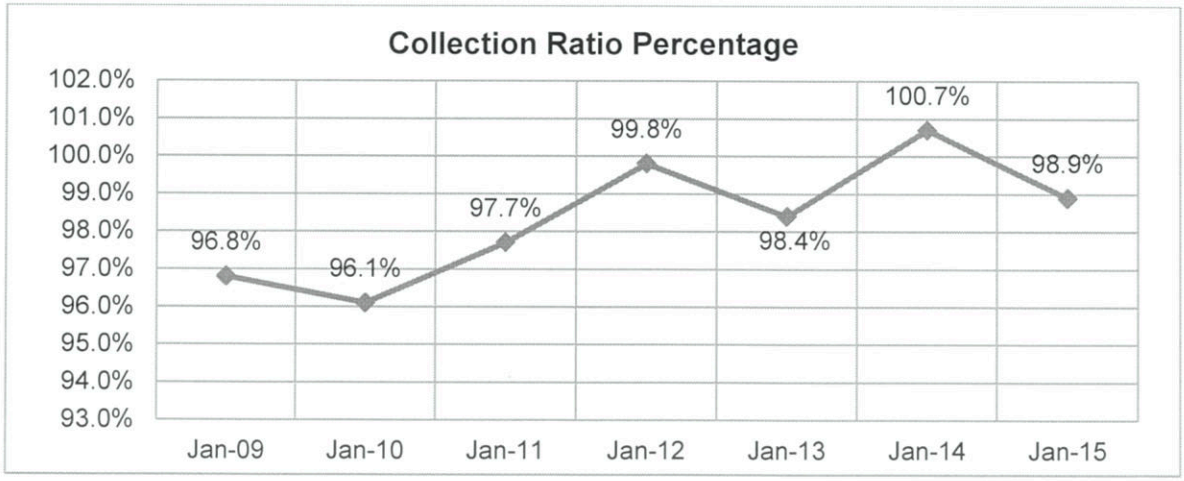
Electricity Revenue

The Electricity Regulation Act No. 4 of 2006 and its Regulations govern the electricity supply industry. Compliance with SANS 474:2009 (NRS 057:2009) "Code of practice for

electricity metering" has been a license condition of the NERSA for the distribution of electricity since December 2005.

There is tremendous pressure for City as well as ESD to perform in the areas of cash collection for services rendered as well as the number of meter reading estimates performed on a monthly basis. Various initiatives have been implemented including encouraging indigent debtors to register, in which case they may have all their arrears, except those relating to tampering and bypassing of meters, written off.

As can be seen in the graph below the bad debts for all conventionally metered electricity consumers has increased as shown by the +150 days line for the period June 2009 to June 2013 but must be seen in the context of large electricity tariff increases over the same period. The 12 monthly average collection ratio has improved over the same period.



Electricity Tariffs

Currently on an annual basis NERSA sets an average tariff increase for municipal distributors as a guideline in determining their annual electricity tariffs. This guideline does not exclude a distributor from the legal obligation to seek approval from both Council and NERSA for tariff increases before implementation.

NERSA is currently in the process of introducing a new system of regulation, namely the Rate of Return Regulation methodology (ROR), which will replace the current system. The impact in the change of methodology is not envisaged to be significant in Cape Town's case and it is expected to take some time before the new system becomes fully functional.

The following legislated principles, which are in the long-term interests of the electricity consumer in South Africa, inform the City's annual tariff adjustment process:

- Electricity tariffs should reflect the underlying costs of supply for the majority of consumers. This will ensure that consumers make rational decisions on electricity consumption, and that the correct levels of resources are, over time, dedicated to electricity supply in South Africa. Tariff structure adjustments shall be introduced in a phased manner, in order to give consumers the opportunity to respond and adjust behaviour accordingly.
- Electricity supply to poor households shall be held below full cost-reflective levels in the medium to long term, for social-development reasons.
- Any levies or cross-subsidies should be transparent and the City should provide sufficient information to consumers in order that they may understand its purpose.

Medium-Term Tariff Outlook

In terms of the City's Medium Term Revenue and Expenditure Framework (MTREF) – based on extrapolating Eskom's Multi-Year Pricing Determination (MYPD) 3 into the MYPD 4 period – the medium-term outlook for tariffs is for above inflationary increases. Tariffs throughout this period are expected to also come under increasing pressure from a loss of sales. Initial studies show that the long term impact of the loss of sales will be substantial unless structural changes to tariffs are made.

Cost of Supply

ESD has completed its first Cost of Supply study. This is used to determine the levels at which cost reflective tariffs should be set and to quantify subsidies between different categories of consumer. The study is important for the City to properly apply its tariff setting principles.

Chapter 5 Conclusion

With the electricity distribution industry environment being in a state of uncertainty around price increases, stability of generation and the impact of the move to alternate technologies, the City of Cape Town will have to look at innovative ways to ensure financial sustainability while managing the electricity requirements of the City in an environmentally responsible manner. The ESD must prepare for the future by being pro-active to remain a relevant player in the energy sector.