DELIVERABLE 4:

MANAGEMENT PLAN – KWADUKUZA LOCAL MUNICIPALITY (KDM)

Project Title: Development of Non-Revenue Electricity Management Strategies and Programmes for KwaDukuza & Mandeni Municipalities

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Contract No.: VILP/I/033

Date: 07/09/2022

Version 0

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Acronyms and Abbreviations

ABBREVIATION	DESCRIPTION
AMIS	Asset Management Information System
AMR	Automatic Meter Reading
BI	Business Intelligence
CRM	Customer Relationship Management
CT	Current Transformer
DBSA	Development Bank of Southern Africa
DMRE	Department of Minerals & Energy
DWH	Data Warehousing
EMP	Electricity Master Plan
FY	Financial Year
FAR	Fixed Asset Register
GIS	Geographic Information System
GPS	Global Positioning System
HEU	High End User
HUC	High Use Customers
HV	High Voltage
ICT	Information and Communication Technology
IDM	iLembe District Municipality
IDP	Integrated Development Plan
IT	Information Technology
KDM	KwaDukuza Local Municipality
kVA	Kilo Volt-Ampere
kWh	kilowatt-hour
LPU	Large Power User
LV	Low Voltage
MMS	Meter Management System
MLM	Mandeni Local Municipality
MIS	Management Information System
mSCOA	Municipal Standard Chart of Accounts
MTSF	Medium Term Strategic Framework
MV	Medium Voltage
MW	Mega Watts
NT	National Treasury

NTL	Non-Technical Losses
NRE	Non-revenue electricity
NRS	National Regulatory Services
PCU	Vuthela Programme Coordinating Unit
PFM	Public Finance Management
PILC	Paper insulated lead covered
POD	Point of Delivery
POS	Point of Supply
PSP	Professional Service Provider
RMSP	Remote Meter Service Provider
SCADA	Supervisory Control and Data Acquisition
SDF	Spatial Development Framework
SLD	Single Line Diagram
SPU	Small Power User
STS	Standard Transfer Specification
TAR	Technical Asset Register
TID	Token Identifier
TL	Technical Losses
ToR	Terms of Reference
TOU	Time of Use
VT	Voltage Transformer
WBG	World Bank Group

1 EXECUTIVE OVERVIEW

This document is the fourth deliverable of the Vuthela iLembe LED Programme's Development of Non-Revenue Electricity Management Strategies and Programmes for the KwaDukuza and Mandeni Local Municipalities. The deliverables are listed below:

- Deliverable one: Inception report
- Deliverable two: Status Quo report
- Deliverable three: Strategy report.
- Deliverable four: Management plan

This deliverable requires two documents to be provided, one each for KwaDukuza and Mandeni Local Municipalities.

This Management Plan Document is for the KwaDukuza Local Municipality (KDM).

This document is a high-level overview of the previous three deliverables and supported with a Project Schedule prioritizing the various strategies into what can be termed a Roadmap.

The final reports of the first three deliverable are included as Annexures for ease of reference.

2 HIGH LEVEL OVERVIEW – D1: INCEPTION REPORT

Zutari was appointed under the Vuthela iLembe LED Support programme under contract VILP/I/033 for the project titled DEVELOPMENT OF NON-REVENUE ELECTRICITY MANAGEMENT STRATEGIES AND PROGRAMMES (NRESP) FOR KWADUKUZA AND MANDENI LOCAL MUNICIPALITIES.

The deliverables of the project consist of:

- D1 – Inception report
- D2 – Situational Analysis and Status Quo Report
- D3 – Formulation of Specific Technical, Financial, Institutional, and Social Interventions & Initiatives.
- D4 - Compilation of a Consolidated Comprehensive Management Plan to Reduce Non-Revenue Electricity within each Municipality (**This Report**)
- D5 – Project Close out report

The project forms part of the Vuthela iLembe LED support programme managed by the Project Coordinating Unit (PCU).

The project is aimed at management strategies to reduce electricity losses. As per the Terms of Reference (TOR), losses in the municipality can be broken down as follows:

- Technical losses = 6 to 8%.
- Non-technical losses = 8 to10%
- Total losses therefore = 14 to 18%

The municipality is experiencing significant revenue loss due to amongst others:

- Electricity theft (Illegal connections and tampering with meters)
- Faulty meters
- Incorrect billing
- Inconsistent indigent registers for allocation of free basic electricity.

The desired outcomes of the project as per the TOR is to enable the municipality to:

- Effectively provide the required bulk electricity capacity for social, industrial, and commercial developments.
- Generate optimal net revenues
- Optimally operate and maintain the existing electricity infrastructure
- Address electricity distribution losses
- Address under- or over-recovery for electricity services delivered
- Address illegal connections and electricity theft

Ultimately the overall objectives can be categorized as:

- ✓ Reduce losses
- ✓ Improve revenue from electricity service charges.

3 HIGH LEVEL OVERVIEW – D2: SITUATIONAL ANALYSIS AND STATUS QUO REPORT

In the situational analysis stage, four main categories had to be assessed, with varying subcategories.

The main categories were:

- Existing Infrastructure
- Technical Losses
- Non-technical losses
- Community / end user campaigns / communication.

The approach and methodology consisted of conducting stakeholder workshops with municipal officials as well as analysis and review of various documents, drawings, reports etc.

Aspects analysed and findings.

The table below provides a summary of the various aspects analysed and the findings on each.

Main Category	Number	Sub-category	Assessment Findings
1. Existing Infrastructure Assessment	**1.1**	Confirm & validate key network installations	No regular revision of single-line diagrams and GIS data
			Need identified for development of additional data sets for - Spatial layer for LV Kiosks - Spatial layer for electricity meters (prepaid & conventional) - Spatial layer for customer network link
	1.2	Desktop Study entire electricity network to determine:	Aged infrastructure with the need for ongoing preventative maintenance
			Refurbishment needs at some substations

		- Composition - Age - Quality - Network modelling	Need for replacement of some aged switchgear / oil switchgear
			Need for the refurbishment of certain aged switching substations
			Ongoing KDM MV upgrade projects are in place
	1.3.A	Undertake general assessment of Metering & Meter Reading for bulk purchases	All electricity purchased from Eskom as sole electricity provider
			Partially completed project to install check meters at Eskom intake points
			Total losses have increased from 16.4% in 2019 to 21.4% in 2021 and climbing
			NERSA benchmark for total losses is 11%
	1.3.B	Undertake general assessment of Metering & Meter Reading for Large Power Use (LPU) customers	493 LPU customers using an average of 15 372 kWh per month per customer
			Not all customers on functioning AMR. Only about 137. 440 have AMR issues such as communication problems
			No data verification system/process in place to verify AMR data prior to importing it into the financial system
			Need identified for deep dive data analysis and clean-up.
	1.4	Assess existing roles & responsibilities & effectiveness of: - Provision of electrical services in general - Meter readings - Revenue collections - Operations & maintenance of electricity services in general	<u>Electricity Provision</u> - Need for filling vacant positions, most notably artisans. - Current shortage of staff to conduct preventative maintenance - Key branches in structure identified for development (Network Control & Support; Protection Telecontrol & Metering; Projects & Assets)
			<u>Billing & Revenue</u> - Several vacancies in metering and credit control
	1.5	Assess adequacy & currency of: - By-laws - Policies - Tariff setting - Asset Management planning - Budget for maintenance & planning	<u>By-laws & policies</u> - The greater extent are in place - Periodic review required to meet current needs
			<u>Tariff setting</u> - Methodology for tariff setting not documented - Current process is to yearly increase incrementally on NERSA approved increase percentages - Possible disparity between bulk cost of electricity and set tariffs - Tariff study & review currently under way

			Asset Management & Planning - Relatively low asset management practice maturity - IMQS Asset Management Plan (AMP) is high level with aim to steer KDM towards quality AM planning - Need identified to move from 80% corrective and 20% preventative to 20% corrective and 80% preventative
			Budgets for Operations & Maintenance - Budgets of approximately R 30m per financial year 2022/23; 2023/24 and 2024/25. - Value approximately 3% of total budgeted costs
	1.7	Assess Technical Management Information System	<u>Systems Identified:</u> - ESRI ArcGIS for spatial planning & development - Munsoft for financial management & billing (mSCOA compliant) - Contour Technology for prepaid electricity vending - Pinnaculum AMR system for automated meter reading of LPU customers - Sage VIP Premier for payroll - Microsoft Excel, Projects, Teams etc - On Key as maintenance management system for electrical assets (not utilized fully)
			<u>Gaps Identified</u>: - SCADA (Supervisory Control & Data Acquisition) - No current functionality; process under way to implement at sub-station level - Asset Management Information System (AMIS) - Solution roadmap presented in separate study; recommendations however not implemented.

Main Category	Number	Sub-category	Assessment Findings
2. Technical Losses	**2.1**	Assess World Bank Group Study on 33kv & 11kv networks of KDM	<u>Two Studies in recent years</u> -2019 Master Plan Revision - Estimated losses for Northern & Southern region at 6% & 8% respectively - World Bank Group study 2021 - Focused on MV network & excluded LV network; 4.92% worst case loss but 4.5% more realistic
	2.2	Determine energy balance ito: - Quantum of electricity loss - Key elements in grid where losses are occurring - Reasons / causes of losses	Conclusion that technical losses can be considered to be around 8.5% Detailed analysis recommended to identify actual percentage

Main Category	Number	Sub-category	Assessment Findings
3. Non-technical Losses	3.1	Assess completeness & adequacy of metering of electricity - various categories of users	Errors between type of account and tariff type. Commercial and domestic account types for example linked to streetlight tariffs.
			A large number of stands (29681; 68% of active customers) have no tariff, nor account type description
			Large need identified for data cleansing
	3.2	Assess adequecy, efficiency of institutional arrangements for meter installations & readings (SOP)	Some SOPs exist, but not for all processes
			Room for improvement noted for process flow type SOP with “swim lanes” and linked to possible SLA between departments
	3.3	Assess adequacy, effectiveness of financial systems wrt: - Metering & billing (PP & Conv) - Historical payment levels - Collections - Cost recovery - Implementation of credit control policies - Ring-fencing of electricity accounts - Free basic electricity - Credit control & debtor management - Revenue enhancement - Customer account management	Main financial system (Munsoft) is mSCOA compliant
			Supplementary prepaid system (Contour Technology) STS compliant.
			Pinnaculum AMR system for Automated Meter Reading of approximate 440 LPU customers. Only about 137 on functional AMR
			No automatic interfacing between systems.
			No supporting Data Management system for data verification and mining purposes.
	3.4	Assess integrity, completeness & accuracy of energy customer data base wrt: - Existing spatial development - Actual number of end users - Reconcile customers in valuation roll to Deeds office & SG listing	A Vuthela Data cleansing project was undertaken and concluded in 2021.
			Although current ongoing data cleansing efforts were mentioned, no detail was provided.
			Cadastral data indicates 34 438 registered stands.
			Valuation roll and customer data base have considerably more stands in its records

		- Assess completeness of info on billing system	4409 stands have multiple prepaid meters linked to it.
			Anomalies in valuation roll and comparative data from valuation roll and customer data base suggest a further data cleansing exercise
	3.5	Review report on Customer Relations Management System and / or Information Systems	Vuthela - Vuthela CRM technical feasibility report dated 30 June 2020. - Strategic plan for the iLembe Regional Customer Care centre dated 19 June 2020 - Initiative withdrawn
			KDM - Need expressed for own customer call centre to be implemented
	3.6	Assess billing & revenue collection re electrical services provision: - Accuracy of billing - Billed revenue vs collected revenue - Returned mail billings - Rd cheque register - Unallocated receipts - Clearing of suspense accounts - Updating debtor's ledgers	<u>Conventional Meters</u> - Approximately 37% of customers are billed estimates
			<u>Prepaid Meters</u> - 42% of customers have not purchased electricity in 12 months
	3.7	Investigate necessity of tariff study & review	Current process under way of cost of supply study and developing tariffs.
			Next step to obtain NERSA approval
	3.8	Review completed Indigent register study wrt: - Community awareness - Formal indigent applications & verification thereof - Assessment of completeness (up to date) status of indigent register - Billing of indigents - Restriction of services to Indigents - Accuracy of offsetting of indigents against equitable share	Existing systems & processes has “gaps”
			Establishment of a centralised repository with following features was recommended: - web and cloud based - secure - audit trail functionality
			Vuthela driven project: - Draft ToR in process of being finalized - Project implementation subject to signing of Memorandum of Agreement (MOA)
	3.9	Debt management: - Monthly review of debtor's age analysis	Large debtor’s book of approximately R 310m
			38% older than 365 days

		- Percentage debt outstanding > 90 days - Review credit control measures - Follow up of existing payment arrangements in place - Councillor involvement in debtor management	55% older than 90 days Domestic consumers biggest contributing category Data gaps with 68% not linked to any customer type. Indicates serious challenges in debtor book management

Main Category	Number	Sub-category	Assessment Findings
4. Community / End-user awareness / behaviour change / electricity theft	**4.1**	Include assessment of current measures to curb illegal connections / theft	Community awareness currently on small scale as part of IDP roadshows in the form of a one slide presentation within the overall IDP roadshow presentation.
	4.2	Take into consideration community awareness re dangers & impact of electricity theft against issues such as poverty & inequality	Need identified for much bigger scale ongoing community engagement and awareness intervention on matters such as responsibility to pay for services and the dangers / consequences of electricity tampering / theft.

4 HIGH LEVEL OVERVIEW – D3: STRATEGY REPORTS

This stage of the project required the formulation of specific Technical, Financial, Institutional, and Social Intervention & Initiatives strategies.

The strategies are aimed at addressing the needs identified during the analysis stage.

Strategies were required to be prioritized within a sustainable programme with the following in mind:

- Quick Wins
- Available funding
- Technical capacity of the municipality.

For this purpose, a strategy matrix was compiled indicating each strategy's level of priority on the following aspects:

- Impact – Measurement of % reduction in losses - **L**ow (0-1%), **M**edium (1-2%), **H**igh (> 2%)
- Quick win – Ability of the strategy to provide significant impact on loss reduction over a short-term period (12 months) – **H**igh impact or **L**ow impact
- Funding Availability – Has funding been **B**udgeted for, or should funding be **S**ourced?
- Technical Capacity – Does the municipality have the capacity available **I**n-house or should **O**utsourcing be considered.

The table below provides a high-level summary of the strategies and their levels of priority for each of above aspects

The priority scale column provides an indication of which strategies are expected to have the biggest impact on reducing energy losses and thus should be implemented as first priority. The priority scale is categorized from 1 – Highest priority to 5 – Lowest Priority

. There are 16 strategies consisting of:

- 5 x Technical
- 4 x Financial
- 6 x Institutional
- 1 x Social

				Priority Matrix			
Strategy nr	**Description**	**Category**	**Priority scale**	Impact	Quick Win	Funding Availability	Technical Capacity
T1	Eskom POS Metering assurance	Technical	4	L	L	B	O
T2	Ensure all LPU Customers on AMR	Technical	3	L	L	B	O
T3	Technical & Non-technical losses separation	Technical	4	L	L	B	I/O
T4	Implementation of SCADA	Technical	4	L	L	B/S	O

	System & Control Centre Phases 1-3						
T5	Electrification & prepaid metering of informal settlements	Technical	3	L	L	S	O
F1	LPU (MD) customer audits & consumption verification	Financial	1	H	H	S	O
F2	Bulk metering of stands with multiple prepaid meters	Financial	2	M	M	S	O
F3	SPU customer metering / vending assurance	Financial	2	M	M	B	O
F4	Review of credit control processes & activities	Financial	4	L	L	B	I/O
I1	Intra- & Interdepartmental Standard Operating Procedures enhancement	Institutional	5	L	L	B	I/O
I2	Tariff study & review	Institutional	4	L	L	B	O
I3	Implementation of KDM CRM system	Institutional	4	L	L	B	O
I4	Implementation of single platform iLembe Indigent Management System	Institutional	5	L	L	B	O
I5	Implementation of Data Warehousing & Business Intelligence (BI) platforms	Institutional	2	M	L	S	O
I6	Establishment of Revenue Protection Unit	Institutional	1	M	M	B/S	I
S1	Community Engagement	Social	2	M	L	B	I/O

From above table it can be seen that the strategy with the highest impact or put a different way, the strategy with the “low hanging fruit” is F1 – LPU customer audits & consumption verification. A short-term intervention for the 2023 financial year has been proposed in this regard.

Each strategy required a high-level scope as well as costing estimate. The table below provides a summary of the strategies, the scope of each and the estimated costs.

Strategy Category	Number	Strategy Description	High level scope	Cost Estimation
1. Technical Strategies	T1	Eskom POS Metering assurance	**Stanger POS** Verify functionality of metering cable from Eskom CT's & VT's Install 2x check meters Install 3x VT, 6x CT's and associated support structures & conductors Download metering data on monthly basis & compare with Eskom billing data	R 1,311,000
			Ballito Substation Install 3x VTS's & 3x CT's & supporting overhead equipment Install check meter Download metering data on monthly basis & compare with Eskom billing data	
			Zimbali Substation Install 3x VTS's & 3x CT's & supporting overhead equipment Install check meter Download metering data on monthly basis & compare with Eskom billing data	
	T2	Ensure all LPU Customers on AMR	Ensure 303 AMR customers have functioning AMR. Replace 53 additional LPU customer's meters with AMR meters	R 2,980,750
			Ensure quality of information uploaded to Munsoft system, including correct meter number, correct install date, correct CT and VT ratios and correct tariff structure.	
			Ensure information in Munsoft system and information in AMR system are mirrored	
	T3	Technical & Non-	Update SLD of KDM network at HV/MV and MV/LV distribution level	R 3,374,000

		technical losses separation	Procure electrical simulation software	
			Build KDM simulation model and establish technical loss methodology and calculation for both demand and energy losses based on the maximum demand, load profiles and load factors – Base. Utilise metering data via control after SCADA phase 1/2/3 projects are implemented and use this to calibrate model. In the interim metering data can be captured directly into spreadsheets custom designed for this purpose at substation and switching substation level.	
			Run network optimisation study to improve network performance, the output of this study will guide the network reconfiguration and strengthening that will support the reduction of technical losses.	
			Annual Technical Loss & Optimisation Study Update	
			Develop losses separation methodology	
			Annual Losses Separation	
	T4	Implementation of SCADA System & Control Centre Phases 1-3	Implementation of SCADA System Phase 1 (HV substations) and control room - Initiated project	R 50,247,591
			Implementation of SCADA System Phase 2 - MV switching substations	
			Smart Metering Phase 3 - MV/LV Distribution transformers (Pilot Project for 50 reticulation transformers)	
	T5	Electrification & prepaid metering of informal settlements	Electrification and installation of prepaid meters Ward 16 - Nyoniyamanzi extensions	R 9,688,800
			Electrification and installation of prepaid meters Ward 13 - Lot 14 extensions	
			Installation of Data Concentrator Units (DCU) for monitoring of meter purchasing patterns, incorporating into Data Warehouse and using Business Intelligence (BI) for data analysis	
			Monthly ongoing data analysis of purchasing history, auditing of meters with no purchases for 90 days.	
			Continuous community engagement & education re payment for services and dangers of electricity theft	

Strategy Category	Number	Strategy Description	High level scope	Cost Estimation
2. Financial Strategies	F1	LPU (MD) customer audits & consumption verification	Monthly analysis of AMR data, prior to importing into billing system	R 9,478,905
			Analyse / investigate causes of inaccurate / missing data	
			Address causes of inaccurate / missing data either through meter maintenance or desktop data corrections	
			Consumption adjustment analysis, back billing calculation and compiling of report for finance to implement corrective billing.	
	F2	Bulk metering of stands with multiple prepaid meters	Identify & list stands with multiple prepaid meters	R 476,050
			Develop program and schedule for replacement over 3 years	
			Put work out on tender with defined scope & deliverables & appoint SP	
			Effect replacements against schedule, ensure meter active against correct account and tariff on stand and all prepaid meters terminated	
			Liaise with stand governing body to implement 3rd party metering supply per dwelling	
	F3	SPU customer metering / vending assurance	Auditing of stands with no record of a meter	R 18,652,000
			Data clean-up and mirroring of Munsoft and Prepaid system information	
			Auditing of conventional meters being estimated	
			Review of meter fault code list	
			Appointment of external Meter Reading Contracting company to read conventional meters	
			Inspections of meters appearing on the faulty meters list & appropriate remedial action	
			Auditing of prepaid meters showing no purchasing for more than 90 days	
			Targeted audits of areas where prepaid meters show purchases lower than the expected benchmark for the specific area	

			Fining of consumers tampering with meters, back billing calculations and compiling of report for finance department to levy against consumer account	
	F4	Review of credit control processes & activities	Outsource Management of Credit control activities	R 2,908,895
			Introduce digital mobile technology for activities execution and quality control	
			Manage processes through proposed Data & Business Intelligence system	

Strategy Category	Number	Strategy Description	High level scope	Cost Estimation
3. Institutional Strategies	**I1**	Intra- & Interdepartmental Standard Operating Procedures enhancement	Draw process flow type SOP for each work process	R 420,000
			Develop SLA & incorporate process flows into document	
			Develop KPI's based on SLA	
			Manage performance accordingly	
	I2	Tariff study & review	Finalize current process of developing tariffs and cost of supply study.	R 780,000
			Obtain NERSA approval	
			Implement approved new tariff structure	
	I3	Implementation of KDM CRM system	Establish Customer Care Centre	R 675,000
			Procure & Implement CRM software	
			Monitor performance against Customer Service Charter	
	I4	Implementation of single platform iLembe Indigent Management System	Drawing up of ToR for role stakeholder input.	Vuthela Funded
			Signing of MOA	
			Procure & Implement IS system	
			Annual review of register	

	I5	Implementation of Data Warehousing & Business Intelligence (BI) platforms	**<u>Data Warehousing</u>** Establish needs & Design system Determine cost & budget accordingly Procure system addressing specific needs Implementation & training	R 5,625,000
			<u>Business Intelligence</u> Establish needs & Design system Determine cost & budget accordingly Procure system that addresses needs Implementation & training	
	I6	Establishment of Revenue Protection Unit	Establish resource requirements & align planned organogram with resource needs	R 27,058,046
			Establish roles & responsibilities by determining strategies to fall under control & management of this unit.	
			Recruit / transfer(second) staff requirements	
			Commence with implementation of identified strategies	

Strategy Category	Number	Strategy Description	High level scope	Cost Estimation
4. Social Intervention & Initiatives Strategy	**S1**	Community Engagement	**<u>Awareness Campaign</u>** Appoint KDM stakeholder engagement specialist Development of comprehensive awareness campaign Implementation of activities Monitoring of activities Evaluation against key indicators	R 4,145,000

			<u>Ward level NRE strategy representative forums</u> Development of forum constitution Announcement of establishment of Ward forums Execution of Ward forum activities (meetings etc)	
			<u>Communication channel management</u> Setting up e-mail & WhatsApp channels Integrate with CRM system Placement of suggestion boxes in public spaces	

5 STRATEGIES ROADMAP

The project schedules overleaf are intended as a strategies “roadmap” for planning purposes. It indicates the timelines of the different projects, highlights projects in different colour codes in terms level of impact on reducing losses and improving revenue and also show dependencies / inter dependencies of certain strategies.

Level of impact colour codes:

- High Impact 
- Medium Impact 
- Low Impact 

Refer to annexure A for the roadmap schedule.

6 COST BENEFIT ANALYSIS

This section provides an overview of the estimated costs per strategy over the next five years.

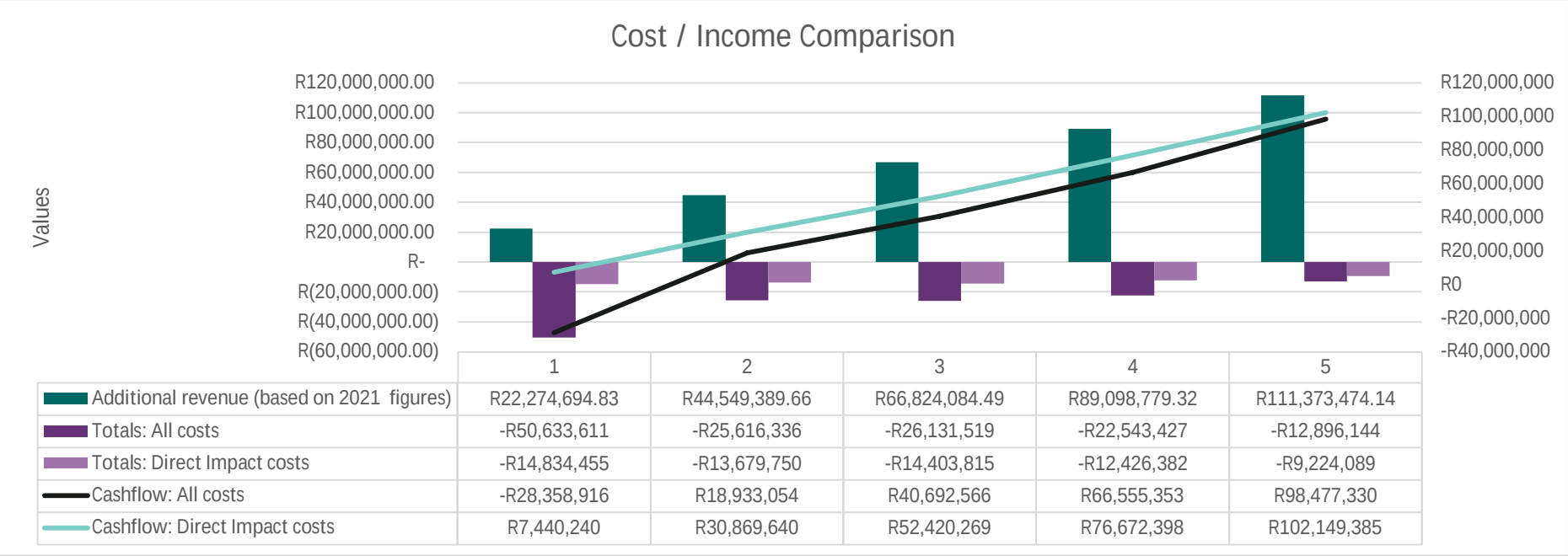
It also provides a comparison between costs and projected reduction of losses and accompanying improved revenue of 2% per financial year for the next five years to reach the NERSA benchmark of 11% losses. These projections are based on the NERSA D forms information of 2021.

The tables below indicate a negative cash flow in the first year but will then quickly turn into a growing positive trend with an ultimate Return on Investment (ROI) of 242% over the five years.

If a split is made between costs that can be deemed costs to be incurred that will have a direct impact on energy loss reduction, then the ROI improves even further to an estimated 517%.

Projected Loss Reduction & Revenue Improvement	Y1	Y2	Y3	Y4	Y5	Totals
Annual loss reduction percentage	2%	2%	2%	2%	2%	10%
Total losses percentage	19.44%	17.44%	15.44%	13.44%	11.44%	11.44%
Additional kWh electricity sales (based on 2021 figures)	13,238,259	26,476,518	39,714,777	52,953,037	66,191,296	198,573,887
Additional revenue (based on 2021 figures)	R22,274,694.83	R44,549,389.66	R66,824,084.49	R89,098,779.32	R111,373,474.14	R334,120,422.43

Strategies Annual Costs Summary	Projected % direct Impact on NRE	Y1 Cost	*Y1 direct cost impact*	Y2 Cost	*Y2 direct cost impact*	Y3 Cost	*Y3 direct cost impact*	Y4 Cost	*Y4 direct cost impact*	Y5 Cost	*Y5 direct cost impact*	Totals All Costs	*Totals Direct Impact Costs*
T1 Eskom POS Metering assurance	1.00%	R1,311,000	*R13,110*	R0	*R0*	R0	*R0*	R0	*R0*	R0	*R0*	R1,311,000	*R13,110*
T2 Ensure all LPU Customers on AMR	50.00%	R1,698,950	*R849,475*	R320,450	*R160,225*	R320,450	*R160,225*	R320,450	*R160,225*	R320,450	*R160,225*	R2,980,750	*R1,490,375*
T3 Technical & Non-technical losses separation	0.00%	R1,762,000	*R0*	R403,000	*R0*	R403,000	*R0*	R403,000	*R0*	R403,000	*R0*	R3,374,000	*R0*
T4 Implementation of SCADA System & Control Centre Phases 1-	0.00%	R24,347,591	*R0*	R8,400,000	*R0*	R8,400,000	*R0*	R7,700,000	*R0*	R1,400,000	*R0*	R50,247,591	*R0*
T5 Electrification & prepaid metering of informal settlements	100.00%	R0	*R0*	R3,703,200	*R3,703,200*	R4,124,000	*R4,124,000*	R1,861,600	*R1,861,600*	R0	*R0*	R9,688,800	*R9,688,800*
F1 LPU (MD) customer audits & consumption verification	100.00%	R2,229,300	*R2,229,300*	R2,229,300	*R2,229,300*	R2,229,300	*R2,229,300*	R2,229,300	*R2,229,300*	R561,705	*R561,705*	R9,478,905	*R9,478,905*
F2 Bulk metering of stands with multiple prepaid meters	10.00%	R0	*R0*	R167,550	*R16,755*	R147,400	*R14,740*	R161,100	*R16,110*	R0	*R0*	R476,050	*R47,605*
F3 SPU customer metering / vending assurance	70.00%	R7,879,600	*R5,515,720*	R2,693,100	*R1,885,170*	R2,693,100	*R1,885,170*	R2,693,100	*R1,885,170*	R2,693,100	*R1,885,170*	R18,652,000	*R13,056,400*
F4 Review of credit control processes & activities	0.00%	R1,192,170	*R0*	R953,736	*R0*	R762,989	*R0*	R0	*R0*	R0	*R0*	R2,908,895	*R0*
I1 Intra- & Interdepartmental Standard Operating Procedures enhancement	5.00%	R420,000	*R21,000*	R0	*R0*	R0	*R0*	R0	*R0*	R0	*R0*	R420,000	*R21,000*
I2 Tariff study & review	5.00%	R780,000	*R39,000*	R0	*R0*	R0	*R0*	R0	*R0*	R0	*R0*	R780,000	*R39,000*
I3 Implementation of KDM CRM system	5.00%	R555,000	*R27,750*	R30,000	*R1,500*	R30,000	*R1,500*	R30,000	*R1,500*	R30,000	*R1,500*	R675,000	*R33,750*
I4 Implementation of single platform iLembe Indigent Management System	0.00%		*R0*		*R0*		*R0*		*R0*		*R0*	R0	*R0*
I5 Implementation of Data Warehousing & Business Intelligence (BI) platforms	50.00%	R2,025,000	*R1,012,500*	R900,000	*R450,000*	R900,000	*R450,000*	R900,000	*R450,000*	R900,000	*R450,000*	R5,625,000	*R2,812,500*
I6 Establishment of Revenue Protection Unit	100.00%	R4,800,000	*R4,800,000*	R5,088,000	*R5,088,000*	R5,393,280	*R5,393,280*	R5,716,877	*R5,716,877*	R6,059,889	*R6,059,889*	R27,058,046	*R27,058,046*
S1 Community Engagement	20.00%	R1,633,000	*R326,600*	R728,000	*R145,600*	R728,000	*R145,600*	R528,000	*R105,600*	R528,000	*R105,600*	R4,145,000	*R829,000*
Total Costs		-R50,633,611	*-R14,834,455*	-R25,616,336	*-R13,679,750*	-R26,131,519	*-R14,403,815*	-R22,543,427	*-R12,426,382*	-R12,896,144	*-R9,224,089*	-R137,821,037	*-R64,568,491*
Cashflow		-R28,358,916	*R7,440,240*	R18,933,054	*R30,869,640*	R40,692,566	*R52,420,269*	R66,555,353	*R76,672,398*	R98,477,330	R102,149,385	R196,299,385	*R269,551,931*
Return on Investment (ROI)		43.99%	*150.16%*	173.91%	*325.66%*	255.72%	*463.93%*	395.23%	*717.01%*	863.62%	*1207.42%*	242.43%	*517.47%*



	1	2	3	4	5
Additional revenue (based on 2021 figures)	R22,274,694.83	R44,549,389.66	R66,824,084.49	R89,098,779.32	R111,373,474.14
Totals: All costs	-R50,633,611	-R25,616,336	-R26,131,519	-R22,543,427	-R12,896,144
Totals: Direct Impact costs	-R14,834,455	-R13,679,750	-R14,403,815	-R12,426,382	-R9,224,089
Cashflow: All costs	-R28,358,916	R18,933,054	R40,692,566	R66,555,353	R98,477,330
Cashflow: Direct Impact costs	R7,440,240	R30,869,640	R52,420,269	R76,672,398	R102,149,385

The projections are subject to variation from aspects such as changes in tariffs and approved Eskom tariffs. For this reason, an annual progress review should be conducted by comparing actual annual projects costs and D form statistics on sales and losses against estimated to track progress and adjust where necessary.

Projected Loss Reduction vs Actual	Y1	Y2	Y3	Y4	Y5
Total losses percentage projected	19.44%	17.44%	15.44%	13.44%	11.44%
Total losses percentage actual	20.00%	0.00%	0.00%	0.00%	0.00%
Variance	-0.56%	17.44%	15.44%	13.44%	11.44%

Strategies Annual Estimated Costs vs Actual Costs	Y1	Y2	Y3	Y4	Y5	Totals
Total Estimated Costs	**R 50,633,611.00**	**R 25,616,336.00**	**R 26,131,518.80**	**R 22,543,426.80**	**R 12,896,144.41**	**R 137,821,037.01**
Total Actual Costs	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
Variance	**R 50,633,611.00**	**R 25,616,336.00**	**R 26,131,518.80**	**R 22,543,426.80**	**R 12,896,144.41**	**R 137,821,037.01**

ANNEXURE A – Roadmap schedule

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1001750 KDM

ID	Task Name	Start	Finish
1	**KDM**	**01 Jul '23**	**30 Jun '28**
2	**Milestones**	**01 Jul '23**	**30 Jun '28**
3	Project start	01 Jul '23	01 Jul '23
4	Project finish	30 Jun '28	30 Jun '28
5	**T1 Eskom POS Metering assurance**	**03 Jul '23**	**30 Jun '28**
6	**Stanger POS**	**03 Jul '23**	**30 Jun '28**
7	Verify functionality of metering cable from Eskom CT's & VT's	03 Jul '23	29 Sep '23
8	Install 2x check meters	03 Jul '23	29 Sep '23
9	Install 3x VT, 6x CT's and associated support structures & conductors	03 Jul '23	29 Sep '23
10	Download metering data on monthly basis & compare with Eskom billing data	02 Oct '23	30 Jun '28
11	**Ballito Substation**	**03 Jul '23**	**30 Jun '28**
12	Install 3x VTS's & 3x CT's & supporting overhead equipment	03 Jul '23	29 Sep '23
13	Install check meter	03 Jul '23	29 Sep '23
14	Download metering data on monthly basis & compare with Eskom billing data	02 Oct '23	30 Jun '28
15	**Zimbali Substation**	**03 Jul '23**	**30 Jun '28**
16	Install 3x VTS's & 3x CT's & supporting overhead equipment	03 Jul '23	29 Sep '23
17	Install check meter	03 Jul '23	29 Sep '23
18	Download metering data on monthly basis & compare with Eskom billing data	02 Oct '23	30 Jun '28
19	**T2 Ensure all LPU Customers on AMR**	**03 Jul '23**	**15 Dec '23**
20	Ensure 303 AMR customers have functioning AMR.	03 Jul '23	15 Dec '23
21	Replace 53 additional LPU customer's meters with AMR meters	03 Jul '23	15 Dec '23
22	Ensure quality of information uploaded to Munsoft system, including correct meter number, correct install date, correct CT and VT ratios and correct tariff structure.	03 Jul '23	15 Dec '23
23	Ensure information in Munsoft system and information in AMR system are mirrored	03 Jul '23	15 Dec '23
24	**T3 Technical & Non-technical losses separation**	**03 Jul '23**	**30 Sep '27**
25	Update SLD of KDM network at HV/MV and MV/LV distribution level	03 Jul '23	15 Dec '23
26	Procure electrical simulation software	08 Jan '24	28 Jun '24
27	Build KDM simulation model and establish technical loss methodology and calculation for both demand and energy losses based on the maximum demand, load profiles and load factors – Base. Utilise metering data via control after SCADA phase 1/2/3 projects a	08 Jan '24	28 Jun '24
28	Run network optimisation study to improve network performance, the output of this study will guide the network reconfiguration and strengthening that will support the reduction of technical losses.	02 Apr '24	28 Jun '24
29	Annual Technical Loss & Optimisation Study Update Y3	01 Jul '25	30 Sep '25
30	Annual Technical Loss & Optimisation Study Update Y4	01 Jul '26	30 Sep '26
31	Annual Technical Loss & Optimisation Study Update Y5	01 Jul '27	30 Sep '27
32	Develop losses separation methodology	08 Jan '24	28 Jun '24
33	Annual Losses Separation Y2	01 Jul '24	30 Sep '24
34	Annual Losses Separation Y3	01 Jul '25	30 Sep '25
35	Annual Losses Separation Y4	01 Jul '26	30 Sep '26
36	Annual Losses Separation Y5	01 Jul '27	30 Sep '27
37	**T4 Implementation of SCADA System & Control Centre Phases 1-3**	**03 Jul '23**	**30 Jun '28**
38	Implementation of SCADA System Phase 1 (HV substations) and control room - Initiated project	03 Jul '23	13 Dec '24
39	Implementation of SCADA System Phase 2 - MV switching substations	06 Jan '25	15 Dec '26
40	Smart Metering Phase 3 - MV/LV Distribution transformers (Pilot Project for 50 reticulation transformers)	08 Jan '27	30 Jun '28
41	**T5 Electrification & prepaid metering of informal settlements**	**01 Jul '24**	**30 Jun '28**
42	Electricifation and installion of prepaid meters Ward 16 - Nyoniyamanzi extensions	01 Jul '24	30 Jun '27
43	Electricifation and installion of prepaid meters Ward 13 - Lot 14 extensions	01 Jul '24	30 Jun '27
44	Installation of Data Concentrator Units (DCU) for monitoring of meter purchasing patterns, incorparating into Data Warehouse and using Business Intelligence (BI) for data analysis	01 Jul '24	30 Jun '27
45	Monthly ongoing data analysis of purchasing history, auditing of meters with no purchases for 90 days.	01 Oct '24	30 Jun '28
46	Continuous community engagament & education re payment for services and dangers of electricity theft	01 Oct '24	30 Jun '28
47	**F1 LPU (MD) customer audits & consumption verification**	**03 Jul '23**	**30 Jun '28**
48	Monthly analysis of AMR data, prior to importing into billing system	03 Jul '23	30 Jun '28
49	Analyse / investigate causes of inaccurate / missing data	03 Jul '23	30 Jun '28
50	Address causes of inaccurate / missing data either through meter maintenance or deskptop data corrections	03 Jul '23	30 Jun '28
51	Consumption adjustment analysis, back billing calculation and compiling of report for finance to implement corrective billing.	03 Jul '23	30 Jun '28
52	**F2 Bulk metering of stands with multiple prepaid meters**	**03 Jul '23**	**30 Jun '27**
53	Identify & list stands with multiple prepaid meters	03 Jul '23	29 Sep '23
54	Develop program and schedule for replacement over 3 years	02 Oct '23	15 Dec '23
55	Put work out on tender with defined scope & deliverables & appoint SP	08 Jan '24	28 Jun '24
56	Effect replacements against schedule, ensure meter active against correrct account and tariff on stand and all prepaid meters terminated	01 Jul '24	30 Jun '27
57	Liaise with stand governing body to implement 3rd party metering supply per dwelling	01 Jul '24	30 Jun '27
58	**F3 SPU customer metering / vending assurance**	**03 Jul '23**	**30 Jun '28**
59	Auditing of stands with no record of a meter	03 Jul '23	29 Sep '23
60	Data clean-up and mirroring of Munsoft and Prepaid system information	02 Oct '23	28 Mar '24
61	Auditing of conventional meters being estimated	02 Oct '23	28 Jun '24
62	Review of meter fault code list	03 Jul '23	29 Sep '23
63	Appoinment of external Meter Reading Contracting company to read conventional meters	01 Jul '24	30 Jun '27
64	Inspections of meters appearing on the faulty meters list & appropriate remedial action	02 Oct '23	30 Sep '26

Low impact
Medium Impact
High Impact

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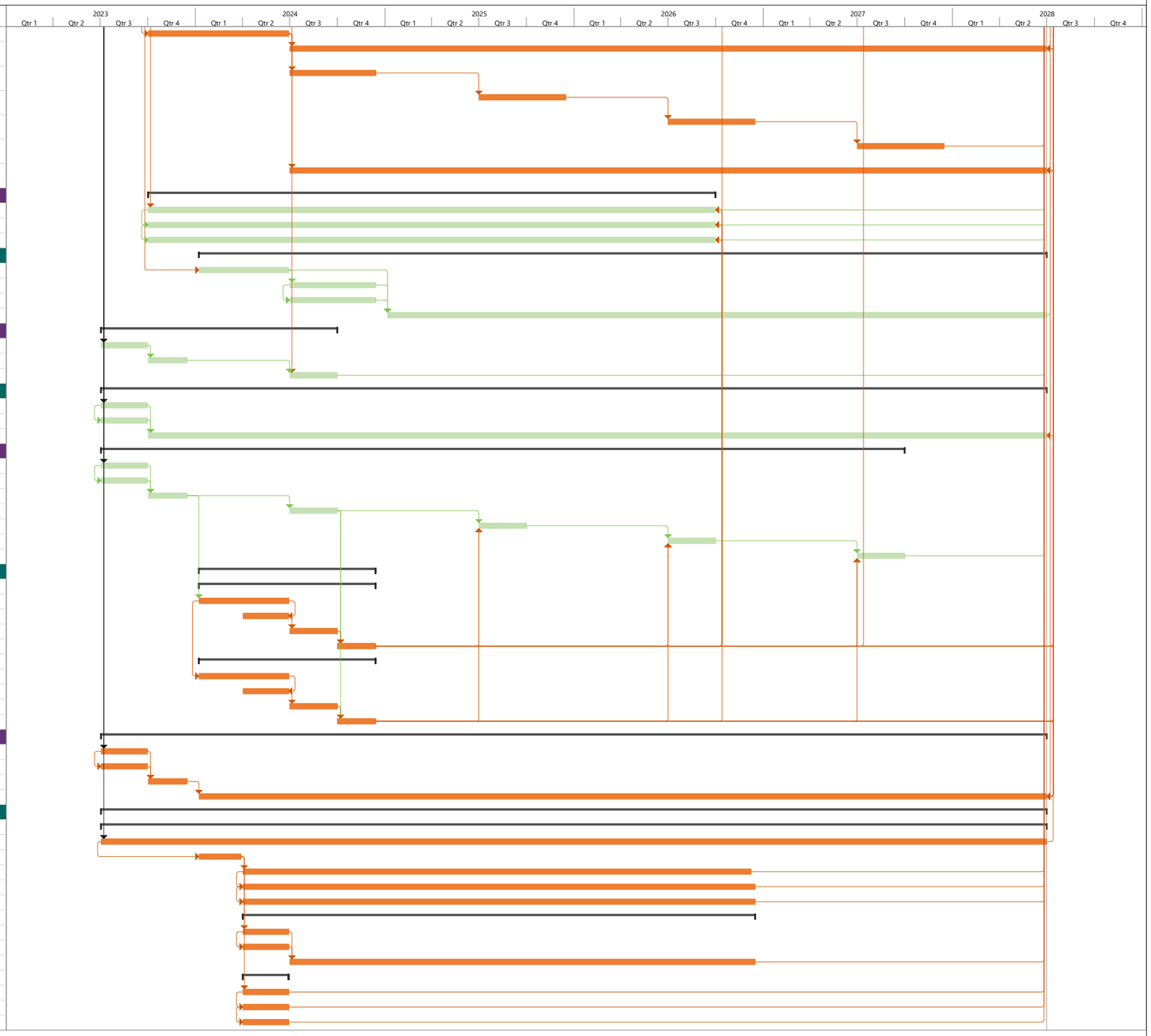
1001750 KDM

ID	Task Name	Start	Finish
65	Auditing of prepaid meters showing no purchasing for more than 90 days	02 Oct '23	28 Jun '24
66	Monthly ongoing data analysis of prepaid purchasing history, auditing of meters with no purchases for 90 days.	01 Jul '24	30 Jun '28
67	Targeted audits of areas where prepaid meters show purchases lower than the expected benchmark for the specific area Y2	01 Jul '24	13 Dec '24
68	Targeted audits of areas where prepaid meters show purchases lower than the expected benchmark for the specific area Y3	01 Jul '25	15 Dec '25
69	Targeted audits of areas where prepaid meters show purchases lower than the expected benchmark for the specific area Y4	01 Jul '26	15 Dec '26
70	Targeted audits of areas where prepaid meters show purchases lower than the expected benchmark for the specific area Y5	01 Jul '27	15 Dec '27
71	Fining of consumers tampering with meters, back billing calculations and compiling of report for finance department to levy against consumer account	01 Jul '24	30 Jun '28
72	**F4 Review of credit control processes & activities**	**02 Oct '23**	**30 Sep '26**
73	Outsource Management of Credit control activities	02 Oct '23	30 Sep '26
74	Introduce digital mobile technlogy for activities execution and quality control	02 Oct '23	30 Sep '26
75	Manage processes through proposed Data & Workforce Management system	02 Oct '23	30 Sep '26
76	**I1 Intra- & Interdepartmental Standard Operating Procedures enhancement**	**08 Jan '24**	**30 Jun '28**
77	Draw process flow type SOP for each work process	08 Jan '24	28 Jun '24
78	Develop SLA & incorporate process flows into document	01 Jul '24	13 Dec '24
79	Develop KPI's based on SLA	01 Jul '24	13 Dec '24
80	Manage performance accordingly	06 Jan '25	30 Jun '28
81	**I2 Tariff study & review**	**03 Jul '23**	**30 Sep '24**
82	Finalize current process of developing tariffs and cost of supply study.	03 Jul '23	29 Sep '23
83	Obtain NERSA aproval	02 Oct '23	15 Dec '23
84	Impelement approved new tariff structure	01 Jul '24	30 Sep '24
85	**I3 Implementation of KDM CRM system**	**03 Jul '23**	**30 Jun '28**
86	Establish Customer Care Center	03 Jul '23	29 Sep '23
87	Procure & Implement CRM software	03 Jul '23	29 Sep '23
88	Monitor performance against Customer Service Charter	02 Oct '23	30 Jun '28
89	**I4 Implementation of single platform iLembe Indigent Management System**	**03 Jul '23**	**30 Sep '27**
90	Drawing up of ToR for role stakeholder input.	03 Jul '23	29 Sep '23
91	Signing of MOA	03 Jul '23	29 Sep '23
92	Procure & Implement IS system	02 Oct '23	15 Dec '23
93	Annual review of register Y2	01 Jul '24	30 Sep '24
94	Annual review of register Y3	01 Jul '25	30 Sep '25
95	Annual review of register Y4	01 Jul '26	30 Sep '26
96	Annual review of register Y5	01 Jul '27	30 Sep '27
97	**I5 Implementation of Data Warehousing & Business Intelligence (BI) platforms**	**08 Jan '24**	**13 Dec '24**
98	**Data Warehousing**	**08 Jan '24**	**13 Dec '24**
99	Establish needs & Design system	08 Jan '24	28 Jun '24
100	Determine cost & budget accordingly	02 Apr '24	28 Jun '24
101	Procure system adressing specific needs	01 Jul '24	30 Sep '24
102	Implementation & training	01 Oct '24	13 Dec '24
103	**Business Intelligence**	**08 Jan '24**	**13 Dec '24**
104	Establish needs & Design system	08 Jan '24	28 Jun '24
105	Determine cost & budget accordingly	02 Apr '24	28 Jun '24
106	Procure system that addresses needs	01 Jul '24	30 Sep '24
107	Implementation & training	01 Oct '24	13 Dec '24
108	**I6 Establishment of Revenue Protection Unit**	**03 Jul '23**	**30 Jun '28**
109	Establish resource requirements & align planned organogram with resource needs	03 Jul '23	29 Sep '23
110	Establish roles & responsibilities by determining strategies to fall under control & management of this unit.	03 Jul '23	29 Sep '23
111	Recruit / transfer(second) staff requirements	02 Oct '23	15 Dec '23
112	Commence with implementation of identified stratgies	08 Jan '24	30 Jun '28
113	**S1 Community Engagement**	**03 Jul '23**	**30 Jun '28**
114	**Awereness Campaign**	**03 Jul '23**	**30 Jun '28**
115	Appoint KDM stakeholder engagement specialist	03 Jul '23	30 Jun '28
116	Development of comprehensive awareness campaign	08 Jan '24	28 Mar '24
117	Implementation of activities	02 Apr '24	07 Dec '26
118	Monitoring of activities	02 Apr '24	15 Dec '26
119	Evaluation against key indicators	02 Apr '24	15 Dec '26
120	**Ward level NRE strategy representative forums**	**02 Apr '24**	**15 Dec '26**
121	Development of forum constitution	02 Apr '24	28 Jun '24
122	Announcement of establishment of Ward forums	02 Apr '24	28 Jun '24
123	Execution of Ward forum activities (meetings etc)	01 Jul '24	15 Dec '26
124	**Communication channel management**	**02 Apr '24**	**28 Jun '24**
125	Setting up e-mail & Whatsapp channels	02 Apr '24	28 Jun '24
126	Integrate with CRM system	02 Apr '24	28 Jun '24
127	Placement of suggestion boxes in public spaces	02 Apr '24	28 Jun '24



Low impact
Medium Impact
High Impact

Annexure B - D1: INCEPTION REPORT

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

edtea
Department :
Economic Development, Tourism and Environmental Affairs
PROVINCE OF KWAZULU-NATAL

ILEMBE DISTRICT MUNICIPALITY
ILEMBE UMASIPALA WESIFUNDA

KWADUKUZA
MUNICIPALITY

MANDENI MUNICIPALITY

Vuthela
ILEMBE LED PROGRAMME

INCEPTION REPORT

Project Title: DEVELOPMENT OF NON-REVENUE ELECTRICITY MANAGEMENT STRATEGIES AND PROGRAMMES FOR THE KWADUKUZA AND MANDENI MUNICIPALITIES

Contract No.: VILP/I/033

Date: 11/02/2022

Version 3

Prepared By:

Richard Ahlschlager	
Chris Johnson	
Martin Piper	
Leon Prinsloo	

Contents

Acronyms and Abbreviations

DBSA	Development Bank of Southern Africa
DEA	Department of Environmental Affairs
DME	Department of Minerals and Energy
DoT	Department of Transport
DWS	Department of Water and Sanitation
IDM	iLembe District Municipality
IDP	Integrated Development Plan
KDM	KwaDukuza Local Municipality
MLM	Mandeni Local Municipality
MPLM	Maphumulo Local Municipality
MTSF	Medium Term Strategic Framework
NLM	Ndwedwe Local Municipality
NT	National Treasury
PCU	Vuthela Programme Project Coordinating Unit
SDF	Spatial Development Framework
SP	Service Provider
ToR	Terms of Reference

1 INTRODUCTION

This report is the Inception Report for the contract: To Develop a Non-revenue Electricity Management Strategies and Programmes for the KwaDukuza and Mandeni Municipalities.

1.1 Key reference documentation

This plan is to be read in conjunction with the documents referenced in Table 1.1.

Table 1.1 Key reference documents

Document number	Title	Date	Reference Source
INVITATION TENDER VILP/I/033	DEVELOPMENT OF NON-REVENUE ELECTRICITY MANAGEMENT STRATEGIES AND PROGRAMMES FOR THE KWADUKUZA AND MANDENI MUNICIPALITIES	2021/07/26	Vuthela Ilembe LED
TENDER RESPONSE A88261	DEVELOPMENT OF NON-REVENUE ELECTRICITY MANAGEMENT STRATEGIES AND PROGRAMMES FOR THE KWADUKUZA AND MANDENI MUNICIPALITIES	2021/08/16	Zutari (Pty) Ltd
PROJECT 27830 NOTICE OF AWARD	DEVELOPMENT OF NON-REVENUE ELECTRICITY MANAGEMENT STRATEGIES AND PROGRAMMES FOR THE KWADUKUZA AND MANDENI MUNICIPALITIES	2021/10/12	Vuthela Ilembe LED
CONTRACT VILP/I/033	DEVELOPMENT OF NON-REVENUE ELECTRICITY MANAGEMENT STRATEGIES AND PROGRAMMES FOR THE KWADUKUZA AND MANDENI MUNICIPALITIES – as amended	2021/10/27	Zutari (Pty) Ltd

1.2 Client and key stakeholder details

The client is, Vuthela Ilembe LED, whose offices are located at Suite 29, First Floor, White House Centre, 13 Chief Albert Luthuli Street, KwaDukuza, 4430. The key contacts within the client organisation are shown in Table 1.2.

Table 1.2 Key client contacts

Name	Role	Email	Telephone
Munya Mutyora	Municipal Infrastructure Manager	munyam@vuthelaled.co.za	+27 76 499 7600
Zama Soji	Public Finance Management Expert	zamas@vuthelaled.co.za	+27 87 056 0945
Andres Detomasi	Technical Advisor – Vuthela/WB	andresdetomasi@gmail.com	+27 65 641 0562
Ferdinand Nel	Technical Advisor - WB	ferdi.nel@icloud.com / r1264c@me.com	+27 82 453 3201

2 BACKGROUND

This initiative is part of the Vuthela LED Programme which entered its implementation phase. The operation of the Vuthela iLembe LED Support Programme is managed by the Project Coordinating Unit (PCU), which is based in the town of KwaDukuza.

The KwaDukuza Local Municipality (KDM) and Mandeni Local Municipality (MLM) are Coastal Municipalities located within the iLembe District. Both the KDM and MLM currently experience technical losses in the distribution of electricity in the order of between 6 and 8 %, and non-technical losses at 8-10%.

Moreover, it is believed that there is a significant amount of revenue that is lost due to theft through illegal connections, potentially faulty meters, incorrect billing, suspected meter tampering, as well as inconsistent indigent registers for the provision of free basic electricity, to mention but a few. Vuthela has appointed Zutari to provide appropriate resources for the development of Non-Revenue Electricity Strategies and Programmes (NRESP) to reduce the technical and non-technical losses in the KwaDukuza (KDM) and Mandeni MLM) Local Municipalities.

The desired outcomes of the NRESP program are that the municipalities will be enabled to:

- Effectively provide the required bulk electricity capacity for social, industrial, and commercial developments.
- Generate optimal net revenues
- Optimally operate and maintain the existing electricity infrastructure
- Address electricity distribution losses
- Address under-recovery or over-recovery for electricity services delivered
- Address illegal Connections and Electricity Theft

3 OBJECTIVES OF THE ASSIGNMENT AS PER THE TOR

The objective of this assignment is to support the municipalities of KwaDukuza and Mandeni with the development of Non-Revenue Electricity Management Strategies and Programmes (NREPS) with the aim of:

1. Reducing losses
2. Improving revenue from energy service charges.

It is envisaged that once the indicative scope of work has been executed, a programmatic, holistic, and systematic approach is documented that will define clear and measurable outcomes for each municipality. One could refer to it is a roadmap for each municipality.

The scope and objectives as set out in the TOR as follows:

E.1.1 Stakeholder Engagement

E.1.2 Situational Assessment (Status Quo)

E.1.3 Electrical Technical Losses of the Municipalities

E.1.4 Inception Meeting & Inception Report

E.1.5 Non-Technical Losses of the Municipality

E.1.6 Formulation of Specific Technical, Financial, Institutional, and Social Interventions & Initiatives.

E.1.7 Compilation of a Consolidated Comprehensive Management Plan to Reduce Non-Revenue Electricity within each Municipality.

E.1.8 Information Management

E.1.9 Existing Documentation

E.1.10. Programme Management, Meetings, Presentations and Reporting

E.1.11. Delivery and Outputs

E.1.12 Methodology (Method Statement) and Programme (Time Schedule)

3.1 E.1.1 Stakeholder Engagement

In the execution of this project, and where required or directed by the client, liaison and consultation with a number of stakeholders for the purposes of information and data collection and collation of the projects, affirmation and/or computation of Scope of Work, present & projected populations, conditions precedent, current and future design work capacities and all requisites' output/outcomes. Stakeholders are, but not limited to:

- The KwaDukuza and Mandeni Local Municipality (Electrical Engineering Services, Revenue Departments and Local Economic Development)
- The Vuthela iLembe LED Programme (Municipal Infrastructure Team and Public Finance Management)
- IFC/World Bank Group (WBG)

- Department of Mineral Resources and Energy (DMRE)
- National Energy Regulator of South Africa (NERSA)
- Department of Cooperative Governance and Traditional Affairs (National and Provincial)
- Eskom
- Municipal Infrastructure Support Agency (MISA)

Any challenges with respect to stakeholder engagement will be escalated to the Vuthela MI Key expert for quick resolution.

3.2 E.1.2 Situational Assessment (Status Quo)

i) Relevant Documentation & Information Assessment: Relevant documentation and information on NRE efforts in the two applicable municipalities will be obtained and the information therein assessed. This will include:
   (1) Previous assessment reports regarding initiatives to reduce electricity losses (technical and non- technical) in the municipalities.
   (2) The history, approach, and results of implementation of NRE in the municipalities
   (3) The completeness and adequacy of the measurement and monitoring system for the electricity load / phase balance in each municipality.

ii) Existing Infrastructure Assessment: Relevant documentation & information of the electricity infrastructure network and associated facilities such as as-built drawings, asset details to be obtained. Consultation with relevant stakeholders to be undertaken to:
   (1) Confirm and validate the existence of key network installations.
   (2) Desktop study of the entire electricity infrastructure network in the Municipalities through as a general assessment to establish the composition, age, quality, general condition, and network modelling thereof using available information or, in the absence of such available information, conducting the assessments. The municipalities' electricity masterplans, GIS Databases, fixed asset registers, asset management plans and any other relevant documentation should be consulted for this purpose.
   (3) Obtain a general assessment of the status, frequency, and adequacy of metering and meter readings for bulk purchases and high usage consumers in the municipal area.
   (4) Identify and assess the existing roles and responsibilities and the effectiveness thereof, regarding the provision of electricity services in the municipality including associated responsibilities such as meter readings, revenue collection, operations and maintenance of electricity services infrastructure, etc.
   (5) Assess the adequacy and currency of the by-laws, policies, tariff setting, asset management planning, and budgeting for operations and maintenance by the municipality in relation to the sustenance of electricity services provision and its associated infrastructure.
   (6) A Scoping study for an Asset Management Information System, and a functional design and specification for the SCADA System & Control Room were completed under the inception phase of the Vuthela Programme. As PSP we are to familiarise ourselves with these studies and use those for reporting on the current technical management information systems in place in the municipality to manage, operate and maintain the electrical service network.

Upon completion of these assessments, a Status Quo report per municipality will be provided in electronic format and presented to the Project Steering Committee for comments.

3.3 E.1.3 Electrical Technical Loses of the Municipality

As PSP we are to familiarize ourselves with the report of a study that was carried out by the World Bank group to roughly estimate the technical losses of the urban 33kV & 11kV networks

of KDM. In this study power flows were run an a “virtual distribution system / network to represent the situation in the field.

From this report, as PSP we are to deduce the energy balance of the municipality in terms of:

- Quantum of electricity loss
- Key elements in grid where losses are occurring
- Reasons / causes of these losses

As PSP we are to advise relevant stakeholders within the municipality on strategic and pragmatic steps to intervention of NRE

3.4 E.1.4 Inception

An inception meeting to be arranged with the client and municipalities with the purpose of discussing the project objectives, project administration and contract signing. Relevant municipal officials will be introduced at this meeting.

An inception report to be provided to the PCU within two weeks of accepting the appointment

3.5 E.1.5 Non-Technical Losses of the Municipalities

It is our experience as consultants in this field, that Non-Technical Losses is expected to be the biggest contributor to Total Energy Losses and subsequent negative impact on revenue from service charges. Areas of possible losses that will be investigated are in inter alia:

1. Assess the completeness and adequacy of metering of electricity use in each Municipality vis - à-vis the various categories of users,
2. Assess the adequacy, effectiveness, and efficiency of the institutional arrangements regarding meter installations and meter readings for bulk and reticulation supplies. Review of the Standard Operating Procedures and providing recommendations/comments for improvement.
3. Assess the adequacy, effectiveness, and efficiency of the financial management systems of the municipalities with regard to
    a. metering and billing (prepaid and conventional meters),
    b. historical payment levels,
    c. collections,
    d. cost recovery,
    e. implementation of credit control policies,
    f. ring-fencing of electricity accounts,
    g. free basic electricity,
    h. credit control and debtor management,
    i. revenue enhancement,
    j. customer account management, etc.
4. Assess the integrity, completeness, and accuracy of each municipality’s electricity customer database in the municipal financial system vis-à-vis
    a. its existing spatial development,
    b. actual number of end users, etc.

Information from the Data Cleansing Project carried out under the Vuthela Programme's Public Finance Management Component (PFM) will be made available to the PSP as the bulk of the work was already completed.

This deliverable must include:

c. A reconciliation of households (customers) in the valuation roll to the Deeds Office and Surveyor General's listing.

d. Assessment of the completeness of the customer information on the Municipality's billing system.

5. Get familiarized with the report on the current customer/consumer relations management and/or information systems in place to log or record customer queries, track the resolution of the query, report on customer queries that was produced under the PFM Component This report also contains information on the incorporation of customer service into performance management of officials and the Electrical Department.
6. Assessment of Billing and Revenue Collection in respect of electricity services provision: This must include an assessment of:
    a. Accuracy of billing
    b. Billed revenue versus collected revenue
    c. Returned mailed billings.
    d. Return to Drawer Cheque Register
    e. Unallocated receipts
    f. Clearing of suspense accounts.
    g. Updating of debtor's ledgers
7. Investigate the necessity for a tariff study and review to ensure that the tariff accurately reflect the costs of providing the electricity services in the MLM and KDM.
8. Get familiarized with the Completed PFM Indigent Register Study to gain insight into the Indigent Management on the provision of electricity services, with respect to:
    a. Community awareness (or lack thereof)
    b. Formal indigent applications and verifications thereof
    c. Assessment of completeness (up-to-date status) of the municipalities' indigent register.
    d. Billing of indigents.
    e. Restrictions of Services to Indigents.
    f. Accuracy (or otherwise) of offsetting of indigents against equitable share.
9. Debt Management
    a. Monthly review of debtors age analysis
    b. Percentage of debt outstanding for more than 90 days
    c. Review of credit control measures.
    d. Follow-up of existing payment arrangements in place.
    e. Councilor involvement in Debt Management
10. Assess the adequacy and effectiveness of any existing efforts by the relevant Business units or Departments or Directorates of the municipalities regarding the implementation of effective community and end-user awareness campaigns and initiatives designed to influence and change community behaviour, and attitudes towards minimization of non-technical electricity losses, payment for services, appreciation and use of electricity, care of end-user infrastructure and facilities, etc.

Zutari is also expected to assess the current measures in place to curb illegal connections and electricity theft in the KDM and MLM. Community awareness initiatives on the dangers and impacts of electricity theft as well as issues around poverty and inequality will need to be taken into consideration. An example is the current KDM Stakeholder engagement programme through the Masakhane Campaign Team to educate the community about the dangers and outcomes of illegal connections.

3.6 E.1.6 Formulation of Specific Technical, Financial, Institutional, and Social Interventions & Initiatives

These will be aimed at:

- curtailing electricity losses,
- reduce non-revenue electricity
- improve performance of the electricity service in KDM and MLM

Two detailed strategy documents (One for each municipality) to be produced by Zutari aimed at assisting in the addressing of the

- technical (real losses)
- non-technical (financial, metering, billing, etc) losses
- institutional inadequacies,
- and social aspects.

In terms of the specific technical, financial, institutional, and social interventions and initiatives (projects) that can be introduced to reduce non-revenue electricity in the KDM and MLM , a clear indication to be provided in terms of:

- Prioritization of the interventions and initiatives within the context of a sustainable programme to reduce the electricity losses and curb non-revenue electricity - after due consideration of potential impact, identification of “quick wins”, availability of funding, and the technical capacity of each municipality.

Zutari will be expected to recommend the most viable intervention, based on highest likely impact towards reduction of NRE in the respective municipalities. This intervention will be developed into a pilot project that will be implemented as part of the Vuthela programme.

- Provide a basic, high-level scope of work for each specific intervention and initiative, roles, and responsibilities within each municipality regarding technical, financial, social, institutional, and social work components

- Estimate required resources (human, skills, financial, etc.) for the implementation of each strategy or initiative to reduce the electricity losses and curb non-revenue electricity.

- Funding options available to each municipality for the implementation of the specific interventions or initiatives in the strategies for reduction of the non-revenue electricity

- Provisional SMART implementation schedules (short-, medium- and long-term timelines) for the specific interventions or initiatives, taking into consideration municipal resources (technical, financial, human); this to form the basis of the programme component of the assignment.

- Risks and risk mitigation measures regarding the implementation of the identified interventions or initiatives included in the strategies.

- Innovative procurement and implementation options for the effective and efficient delivery of the specific interventions or initiatives

- Recommendations for the sustainability, institutionalization, and mainstreaming of the specific interventions and initiatives as an on-going programme within the municipality vis-à-vis the required technical, financial, and institutional resources.

Proposed strategies to be presented to the PSC, whereafter the reports are to be submitted in draft form for comment & finalization.

3.7 E.1.7 Compilation of a Consolidated Comprehensive Management Plan to Reduce Non-Revenue Electricity within each Municipality

The Compilation of these plans are an amalgamation of the findings of the above sections and outlines:

- The results and findings of stakeholder engagement, existing situational assessment, documentation, and information obtained, challenges encountered, etc.
- The strategic technical, financial, institutional, and social interventions and initiatives (projects) that can be introduced to reduce the non-revenue electricity. (The technical component to comprise of findings deduced from the Estimation of technical energy losses report produced by the World Bank Group, the Electricity Masterplans, technical drawings, reports, and GIS data provided to the PSP)

These final reports will be the key documents to be presented to the respective Municipal Management Committees (MANCO'S) and councils for approval. Zutari's understanding is that they will in effect form the roadmap for each municipality towards a reduction in losses and improved revenue.

3.8 E.1.8 Information Management

All electronic information, including reports, spatial data, modelling & preparation of drawings form part of the deliverables of this project. Information can be requested by the client in any of the following formats:

- MS Word
- MS Excel
- PDF
- CAD
- GIS

3.9 E.1.9 Existing Documentation

The following documentation will be made available for the purposes of this project:

- KwaDukuza Local Municipality Electricity Master Plan and network drawings, July 2019.
- Mandeni Local Municipality Electricity Master Plan and network drawings, July 2019.
- KwaDukuza Local Municipality Fixed Asset Register (Latest version).
- Mandeni Local Municipality Fixed Asset Register, (Latest Version).
- Report from the IFC / World Bank on Getting Electricity and recommendations from the site visit, February 2018.
- KwaDukuza and Mandeni Electricity Asset Management Plans & Scoping for an Asset Management System; SCADA & Control Room

Revenue & Finance-Related Information and Documents to be made available.

- KDM Electricity Metering and Billing report or listing (Prepaid and Conventional).
- MLM Electricity Metering and Billing report or listing (Prepaid and Conventional).

- KDM Standard Operating Procedure (SOP) for electricity metering, billing, and revenue management.
- MLM Standard Operating Procedure (SOP) for electricity metering, billing, and revenue management.
- KDM Budget for Electricity Services approved 2019/2020 and as available for MTEF 2020/2021.
- MLM Budget for Electricity Services approved 2019/2020 and as available for MTEF 2020/2021
- KDM Audited Financial Statements 2019/2020.
- MLM Audited Financial Statements 2019/2020.
- Feasibility Study for The Establishment of a Regional Customer Care Centre Phase I
- Revenue Management
- A single indigent register across all municipalities (Alignment of Indigent policies, uniform systems, and processes for maintaining a single indigent register across municipalities).
- Data cleansing (Development and implementation of Data Management Systems)

3.10 E.1.10 Programme Management, Meetings, Presentations and Reporting

- Meetings & Workshops & Presentations
    - Monthly progress meetings to be attended.
        - Meetings may be preferred to be virtual
        - Zutari to provide meeting notes, minutes, and presentations within 7 days to the PSC
    - 4 Virtual workshops to be conducted
        - First two with municipal officials of each municipality separately
            - Status quo report to flow from these sessions
            - Status quo reports to be presented in one of the monthly progress meetings
        - The other two workshops to be held with both municipalities to discuss the formulation of the specific technical, financial, institutional, and social strategies and initiatives to curtail electricity losses, reduce revenue loss and improve the performance of the electricity service
    - Presentation(s) on completed activities to PSC meeting
    - Presentation at contract end to MANCO of KDM & MLM respectively, on completed activities
- Reporting
    - Inception report
        - Within two weeks of inception meeting
    - Weekly progress statements
        - Electronic & via e-mail
        - PSC to provide format
    - Phase reports
        - Status Quo reports per municipality
        - Strategies & Initiatives report per municipality
    - Consolidated Comprehensive Management Plan
    - Project close out report
        - PSC to provide format
        - One electronic
        - Three hard copy

3.11 Summary of Delivery and Outputs

- Inception Report, three hard copies, one electronic copy.

- Status Quo reports for KDM and MLM, one electronic copy per municipality, including all supporting GIS, CAD and electronic information. (drafts in MS Word Format are required to be circulated for ease of commenting and contribution)
- Two Non-Revenue Electricity Strategies (Technical, Financial, Institutional, And Social Interventions and Initiatives report) for KDM and MLM, one electronic copy per municipality.
- Consolidated Comprehensive Management Plans to Reduce Non-Revenue Electricity for KDM and MLM, three hard copies for each municipality, one electronic copy, including all supporting GIS, CAD and electronic information.
- Four (4) virtual Workshops with IDM and KDM officials
    - Two (2) during Status Quo Stage
    - Two (2) to formulate the NRE Technical, Financial, Institutional, And Social Strategies and Initiatives.
- Attendance of monthly progress meetings and provision of meeting notes.
- Submission of weekly electronic progress notes (email template to be provided).
- Close-out report, three hard copies, one electronic copy.
- Presentation of the Consolidated Comprehensive Management Plan to the Project Steering Committee, one electronic copy of the Consolidated Comprehensive Management Plan
- Presentations to Manco's of each municipality

3.12 Methodology (Method Statement) and Programme (Time Schedule)

These aspects are covered in sections 5 & 6 of this report.

4 INITIAL INSIGHTS, ASSUMPTIONS, RISKS

4.1 Initial Insights

- Initial insights are that there is currently active progress from stakeholders and actors mobilising along the objectives of this project and that we will need to align with these initiatives to prevent effort duplication. We will need to get a picture of these activities as soon as possible, and this will be incorporated into the situational assessment.

4.2 Assumptions

- Data availability, customer base and categories are available already and that this will be provided as a data dump for review and analysis.
- KwaDukuza network information and Mandeni network is available and relatively accurate to functional levels.
- The financial information per customer is available.
- We will not be conducting a tariff study but will look at the applicability of the tariffs as per the TOR, and assess the need for a tariff study & review.

4.3 Risks

- Data accuracy and availability is inadequate.
- Timelines in obtaining information and for setting up workshops.

5 PROGRAMME APPROACH

5.1 Overview of the Methodology

The delivery of non-revenue electricity loss management through both the strategic planning and framework development requires a systemic process to identify and unlock the causes resulting in these losses.

5.1.1 Developing a Framework with Emergent Programmes

We advocate a formalised project development process before investing non-revenue losses. The following questions will need to be answered in this phase of the programme development:

- What is the current environment?
- What is causing revenue loss?
- What needs to change? (e.g. institution, capacity, skills?)
- Where shall we prioritize investment to maximize benefits and value?

To get the above answers we propose the following short-term outcomes (in order of importance):

- Understand the environment of the municipalities including all role-players (public, regulatory, social, institutional, etc.) and to understand what the various challenges are being faced by the stakeholders (e.g. systems, resources, non-cost-reflective tariffs, losses, corruption, supply chain challenges etc.).
- Review of institutional competencies and capacities to manage revenue and infrastructure successfully (we need to ensure whatever is invested in can be maintained and build upon to be sustainable)
- Understand the current infrastructure and their shortcomings (i.e. meter technology, communications, systems, etc.) – this will provide inputs for the implementation plan and future development needs.
- Understand the energy & load usage coupled with embedded generation so as both prioritize and forecast opportunities and risks.
- Develop a transformative development program (that will move the municipalities from their current state into the planned future state with the appropriate governance systems to timeously drive beneficial change.

5.1.2 Functional Areas

There is an awareness that electrical non-revenue loss management has both supply and demand side considerations:

Figure 1: Supply and Demand Side Issues

The following functional areas have been identified:

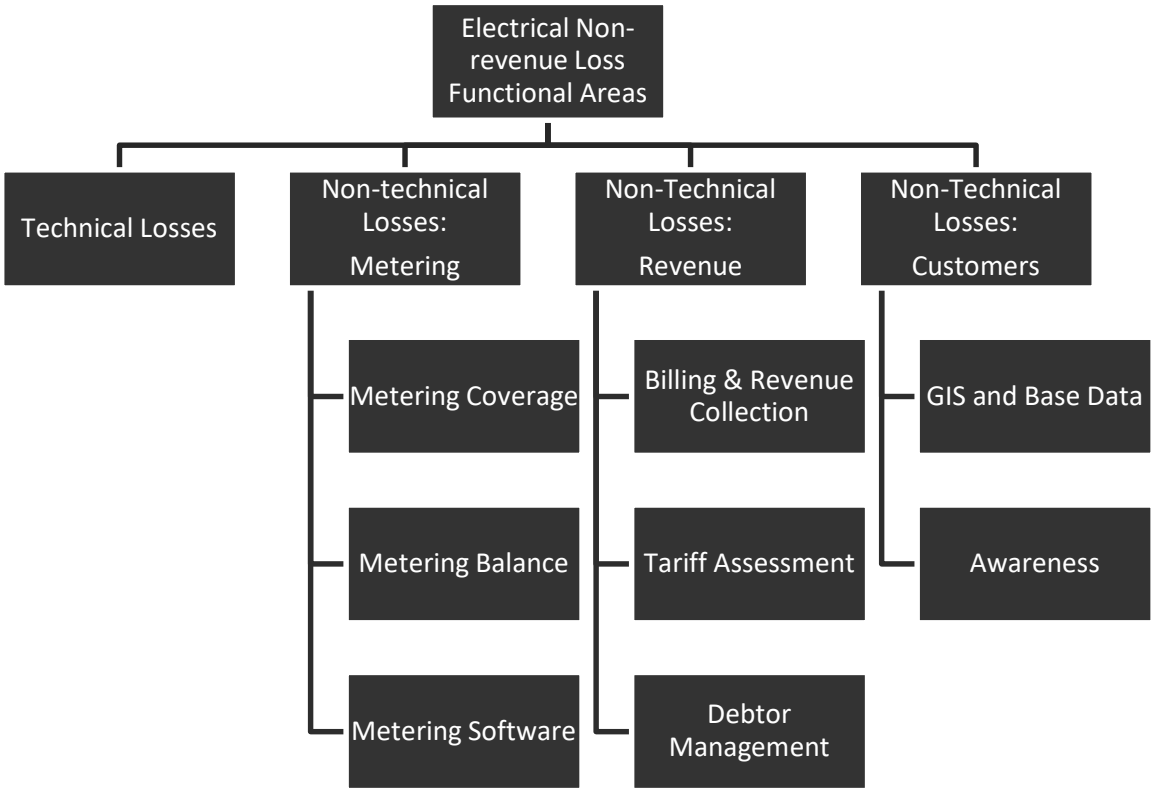


Figure 2: Non-Revenue management functional WBS

5.1.3 Programme Theory

Programme Theory is also called the Theory of Change. What change are we looking for and what enablers will unlock this change? The implementation phase and realisation of the benefits is known as the Theory of Action. What needs to be done to achieve the outputs, outcomes and to the have the impact envisaged.

World Bank's Independent Evaluation Group has produced a how to guide for what they term "A Results Framework" process, in essence the World Banks standardized approach to "Program Theory".

1.1.1.1 The Results Framework Approach

A results framework is an explicit articulation (graphic display, matrix, or summary) of the different levels, or chains, of results expected from an intervention—project, programme, or development strategy. The results specified typically comprise the longer-term objectives (often referred to as "outcomes" or "impact") and the intermediate outcomes and outputs that precede, and lead to, those desired longer-term objectives.

A generally useful approach is to consider outputs as the particular goods or services provided by an intervention (for example, solar home PV systems), whereas an outcome is usefully thought of as benefits of that particular good or service to the target population (such as improved electrification rate), and impact refers to evidence on whether outcomes are actually changing beneficiary behaviour or longer-term conditions of interest (for example, increased standard of living, an uptake in economic activity). The key is to distinguish between the provision of goods and services (which involves supply-side activities) and actual demand for and/or utilisation of those goods and services (demand-side response).

Defining cause-effect linkages for one or more interventions lays the groundwork for a results framework. Thus, the development of a good results framework requires clarity with respect to the theory of change – the reasons why the project, programme, or strategy will lead to the outputs; why those outputs are likely to lead to the immediate or intermediate outcomes; and how those outcomes are (at least hypothetically) linked with longer-term outcomes or impact.

Outcomes and impacts are the primary focus of a results framework; project inputs and implementation processes are generally not emphasised, although outputs are often noted. This conceptual presentation of a results chain (outputs, outcomes, and impacts) is often accompanied by a more detailed plan for monitoring progress toward the ultimate objectives through measuring the achievement of outputs, outcomes, and impacts at different intervals of time. Hence this Results Framework report would be accompanied with a Programme Implementation framework.

A results framework also often identifies any underlying critical assumptions that must be in place for the intervention to be successful, that is, to lead to achieving the targeted outcomes and impacts.

1.1.1.2 Developing a Results Framework

A results framework builds on, and helps articulate, a project's or programme's theory of change — the causal pathways from the planned interventions to the intended outcomes. Actions for developing a results framework therefore start with understanding both the problem to be addressed and the desired outcomes, specifying the programme logic, and building stakeholder consensus related to this theory of change.

The results framework required four types of information:

1. An understanding of the problem or assessment of needs that the development intervention is intended to address,
2. An initial theory of change for the project or programme, even as it is being designed,
3. A working knowledge of evidence required for measuring and assessing desired outcomes and impacts,
4. Available data sources and proven data collection approaches relevant for the project or programme context.

1.1.1.3 Literature and Standards Review

As part of the approach, we would follow a literature review and research phase where we would seek to obtain the following:

1. Examples of current local and international programs, their performance and critical success factors
2. Seeking to determine root causes and perspectives of other utilities and their approaches.
3. Understand past and current associated initiatives within the municipalities.
4. Collation of relevant RSA standards for compliance

1.1.1.4 Causal Analysis (incorporated into the Situational Analysis)

We are proposing system thinking to try and get clarity of the causes behind the non-revenue loss issue. We are proposing an approach that unpacks the root causes behind what the key issues are that are self-replicating. There is never just one issue at hand. The process is done as follows:

1. Literature review on issues
2. Zutari develop a base model of the causal loops
3. Zutari host protracted workshops to “test” and refine the model with as many broad based actors as possible from both supply and demand side with local exposure. Success will be based on getting as many of the key actors involved…this is a very important part of the process as all stakeholders feel part of the process, and also become stakeholders in identifying solutions.
4. The model is updated, circulated and approved by the parties.
5. A results framework is developed that traces the primary root causes.
6. These are then ranked according to agreed weighted factors based on cost, complexity and time
7. The interventions schedule is developed from this as an outcome.

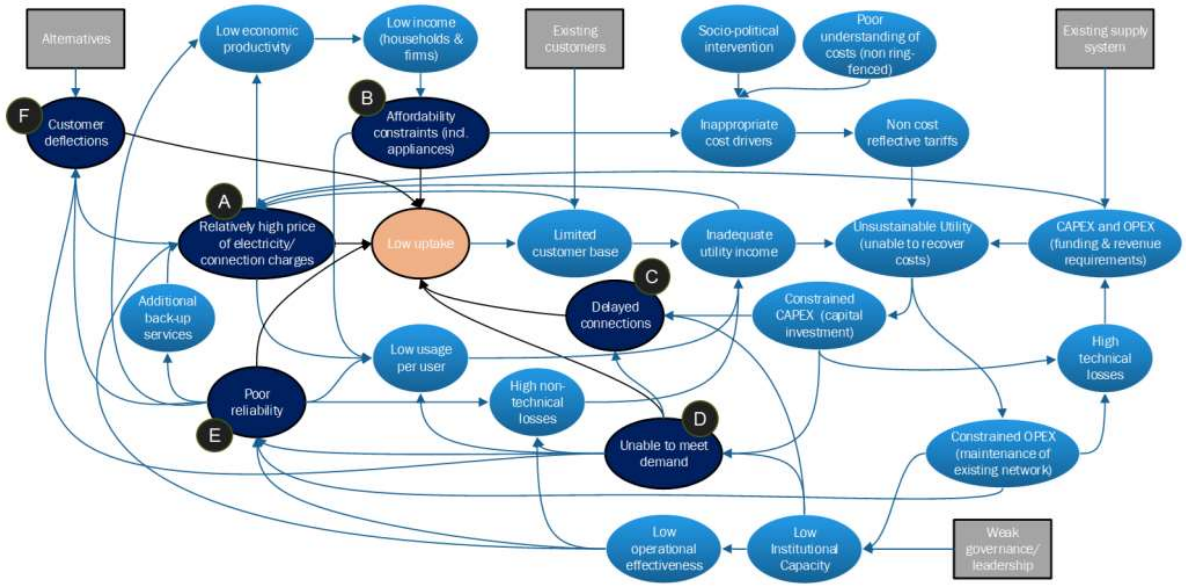


Figure 3; Causal Loop Diagram example

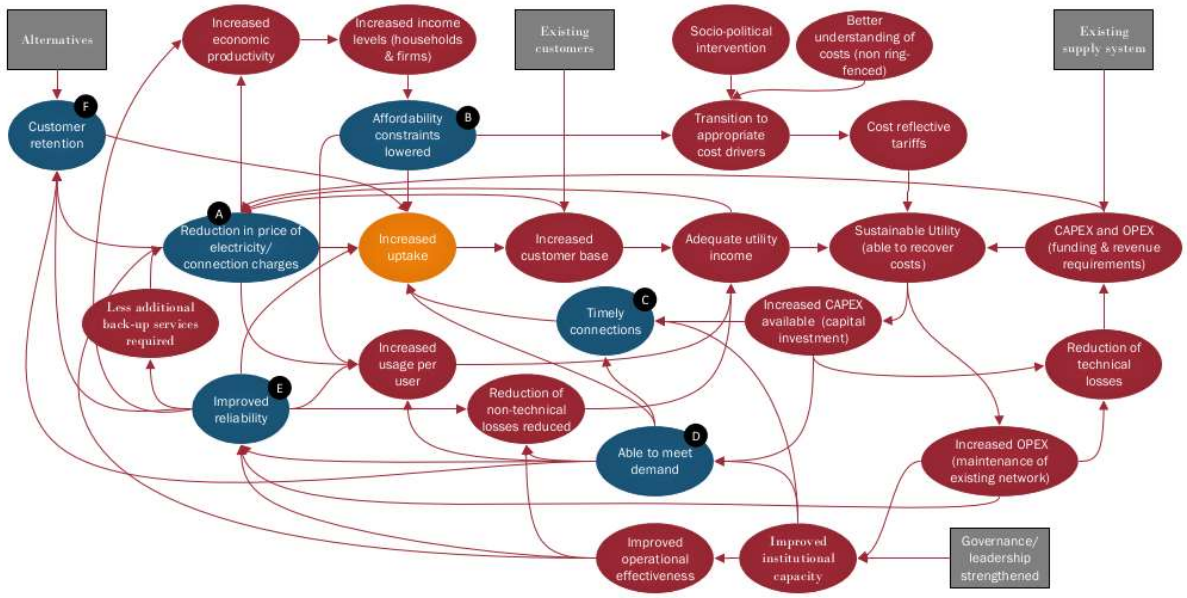


Figure 4: Results framework example

5.1.4 Project Breakdown

The project can be broadly described as having five phases, each with certain inputs, activities to undertake, and outputs. The four phases are defined as 1) Inception, 2) Situational Analysis & Status Quo, 3) Development of Intervention Initiatives, 4) Compilation of Comprehensive Management plans, and 5) Project Close Out.

The below table provides a detailed summary of each phase, broken down into Inputs, Activities, and Outputs / Deliverables.

Table 1: Phase, Inputs, Activities, and Outputs mapping

Phase	Inputs	Activities	Outputs / Deliverables
1. Inception	Signed Acceptance of appointment	• Inception Meeting	• Inception Report

2. Situational Analysis & Status Quo	• Inception report
	• Infrastructure information
	• Municipal information:
	  ○ Applicable by-laws & policies
	  ○ Financial system data (customer data base etc)
	• Vuthela Scoping Study for Asset Management Information System
	• Vuthela Functional Design & Specification for SCADA System & Control room
	• Various PFM reports:
	  ○ Customer Relations Management – Information System
	  ○ Indigent Register Study
	  ○ Data Cleansing Project
	• Worldbank Group report on Technical Losses for KDM
	• KDM Stakeholder Engagement Programme (Masakhane Campaign)
	• Other information as the need for them are identified during the project
		• Confirm & validate key network installations
		• Desktop study of entire energy network
		• Assessment of roles & responsibilities
		• Assessment of applicable municipal by-laws, policies, tariff setting, asset management, budget planning
		• Study Vuthela AM study & SCADA System & Control room study
		• Study Worldbank Technical losses KDM study
		• Assessment of municipal financial data:
		  ○ Customer data
		  ○ Billing data
		  ○ Pre-paid meter sales data
		  ○ Debtor data
		  ○ Customer spatial data
		  ○ Study PFM indigent Register study
		  ○ Review debtor management data & credit control measures
		• Assessment of community / end-user awareness campaigns
		• Stakeholder workshops
		  ○ One with KDM stakeholders
		  ○ One with MLM stakeholders
			• 2 Status quo reports
			  ○ One for KDM
			  ○ One for MLM
			  ○ To be presented at monthly progress meeting
			  ○ Format will be electronic in MS Word format as well as MS PowerPoint Summary Presentation

3. Formulation of Specific Technical, Financial, Institutional & Social Intervention Initiatives	• Status Quo Reports
	• All other relevant data & documentation from Phase 2
	• 2 combined workshops
		• Identify initiatives & interventions that will address the gaps / shortcomings identified during phase 2	• Two detailed strategy reports
			  o One for KDM
			  o One for MLM
			• Reports to address:
			  o Technical losses
			  o Non-technical losses
			  o Institutional inadequacies
			  o Social aspects
			• Recommendations to be sustainable
			• Presentation to PSC
			• Format in MS Word with Summarized overview in PowerPoint

4. Compilation of Consolidated Management Plan	• All information, documents & reports from Phases 2 & 3	• Amalgamate findings of Phase 2 and Recommendations of Phase 3 into a roadmap for each of the municipalities	• Key document to be presented to ManCo's & Councils of each municipality • Format in MS Word with Summarized overview in PowerPoint
5. Project Close Out	• All Information, documents & reports from previous phases	• Produce project close out report & present at final project meeting	• Project close out report • Format in MS Word with Summarized overview in PowerPoint
Project Underpinning Activities o Stakeholder Engagement o Various Meetings o Supported by documents such as notes, minutes, recordings etc. o Progress Reports			

5.2 Project Management and Administration

5.2.1 Client management

1.1.1.5 Meetings

Meetings will be held with the client every monthly at either online or at the client offices. The meeting minutes will be recorded, drafted, issued for circulation and finalised by Project Manager. The Project Manager, or delegate, will review before issue.

1.1.1.6 Reporting

Summarized weekly progress reports will be issued by email.

Client formal reports will be issued monthly as minutes to the monthly progress meetings.

1.1.1.7 Relationship management

The Zutari Project Manager for this project is Martin Piper. The client relationship will be managed by the following means:

- Direct contact between the Zutari Project Manager and Client Representative
- Informal meetings between the client and the Project Manager on a regular basis
- Requesting of formal feedback by the Client Director/Manager at final report delivery using the client feedback form.

5.2.2 Stakeholder management

Stakeholders with an interest/involvement in this project include:

Stakeholder Name	Organisation / Division	Role / Job Title / Skill	E-mail
Munya Mutyora	Vuthela	Municipal Infrastructure Manager	munyam@vuthelaled.co.za
Monja Esterhuizen	Vuthela	Municipal Infrastructure Manager	monyae@vuthelaled.co.za
Zama Soji	Vuthela	Public Finance Management Expert	zamas@vuthelaled.co.za
Ferdi Nel	World Bank	Technical Advisor	ferdi.nel@icloud.com / r1264c@me.com
Andres Detomasi	World Bank/Vuthela	Technical Advisor	andresdetomasi@gmail.com
Sibusiso Jali	KwaDukuza Municipality	Electrical Dept Head	sibusisoj@kwadukuza.gov.za
Raeesa Bayat	KwaDukuza Municipality	Finance	raeesab@kwadukuza.gov.za
Selby Msweli	Mandeni Municipality	Electrical Dept	selby.msweli@mandeni.gov.za
Senzo Makhoba	Mandeni Municipality	Finance	senzo.makhoba@mandeni.gov.za

5.3 Zutari team

5.3.1 Personnel

The project is being delivered by Zutari (Pty) Ltd and lead by the Ethekwini Office. The names and contact details of Zutari's key personnel and their roles/relationships are shown in.

Table 5.1 Zutari's key personnel and roles/relationships

Name	Role	E-mail	Phone
Martin Piper	Project Manager	Martin.Piper@zutari.com	+27 31 5755500 +27 83 6616007
Richard Ahlschlager	Project Director	Richard.Ahlschlager@zutari.com	+27 31 5755500 +27 83 7311115
Leon Prinsloo	Senior Technical Specialist	Leon.Prinsloo@zutari.com	+27 82 3779707
Chris Johnson	Senior Technical Specialist	**Chris.Johnson@zutari.com**	+27 51 4089613 +27 82 7881999
Tebogo Sebego	Institutional Specialist	**Tebogo.Sebego@zutari.com**	+27 12 4273638 +27 66 4858732
Warrick Pierce	Economic Specialist	**Warrick.Pierce@zutari.com**	+27 12 4272839 +27 73 3212783
Prasun Seebran	Technical Support	**Prasun.Seebran@zutari.com**	+27 31 5755500 +27 74 9942652

5.3.2 Team competency

A key resource requirement is an experienced electrical revenue specialist. This competency is a minimum-non negotiable for this project. Chris Johnson is the currently assigned specialist.

Table 5-2: Technical Team Details

Position	Name	Qualifications	Years	Registrations
Project Director	Richard Ahlschlager	MEng (PM) BSc Elec Eng	25	Pr.Eng Pr.CPM
Project Leader	Martin Piper	NDip Elec	26	Pr.Tech
Asset Management Specialist	Leon Prinsloo	CAMA (WPiAM), PRINCE2, BComm (Hons)	13	Certified Asset Manager WPiAM
Senior Energy Advisor	Chris Johnson	HNDip Elec	29	Pr.Technologist Pr.CPM Member, SA Revenue Protection Association (SARPA)
Institutional Specialist	Tebogo Sebogo	MEnv, MTh	37	IAIAsa, IAP2 SA, SACE
Economic Specialist	Warrick Pearce	MSc Energy Economics and Policy	10	ISES, STERG

5.3.3 Team meetings and communication

The following key meetings in Table 5.3 are to take place.

Table 5.3 Meetings

Meeting	Attendees	Frequency	Chair
Inception meeting	Zutari leads and all Stakeholders	Start Project	Munya Mutyora
Internal Project Management Team Meeting	Zutari team	Weekly	Martin Piper
Project Progress Meeting	Zutari Key Leads and Client Representatives	Monthly	Munya Mutyora
Discipline/Technical coordination meetings	Zutari, Clients & IDM and KDM officials	Ad-hoc	Martin Piper
Status Quo Virtual Workshop	Zutari, Clients & IDM and KDM officials	Two meetings	Munya Mutyora
NRE Workshop	Zutari, Clients & IDM and KDM officials	Two Meetings	Munya Mutyora

5.4 Health and safety

At Zutari, a robust and responsive health and safety (H&S) culture is a commitment we make to every employee, client, and community member. Every staff member deserves to be protected and cared for, and to return home safely every day.

Our strong H&S culture is supported by an H&S strategy that is founded on three key areas.

Leadership - equipped and dependable leaders who accept accountability for H&S with confidence

Competence - skillful risk awareness and displaying ownership of an H&S culture to keep ourselves and our staff safe

Wellness - increased display of knowledge and resilience in all aspects of well-being by employees

Our H&S culture is underpinned by a detailed, targeted, and responsive safety governance framework and management system. The management system is designed to meet the fundamental approach of ISO 4501.

Together, the Zutari H&S strategy and framework support the delivery of projects and meet legislative and client requirements.

To further support H&S on projects, Zutari has identified 10 My Life Saving Rules (MLSR), which have been compiled following a risk-based assessment of our typical activities and exposure to hazards.

There is a standard procedure with supporting documentation available for each one of the following 10 MLSR:

- Fitness for work
- Land transport
- Working at heights
- Confined spaces
- Energy sources and isolation
- Excavations and breaking of ground
- Travelling to, and working in high risk environments
- Alone or isolated work

- Lifting and suspended loads
- People, plant and traffic separation

To enhance the impact of the H&S campaign, we personalised the MLSR by introducing the slogan "Because People Depend on You", which resulted in an increased risk awareness and ownership among staff.

5.4.1 Key Project hazards

During the project the following general activities are expected to be undertaken:

- Office-based
- Site-based inspections
- Travelling
- Visits at controlled/uncontrolled locations

Potentially hazardous activities associated with this project include:\

- Unusual security, travel or health and safety risks (associated with electricity theft)

5.4.2 Training

Where particular hazards emerge that require training, Zutari will initiate an awareness program to all impacted employees and stakeholders as applicable.

5.4.3 Communication

Zutari will maintain lines of communication to confirm that employees are made aware of health and safety issues and of the actions being taken to address them. These include (but not limited to) the following:

- Pre-Start Meetings, Site Meetings, Project Meetings, Notices

5.5 Quality Control

5.5.1 General

We operate an ISO 9001 aligned quality management system. This system focuses on sensible planning, proactive risk management, multi-stage verification, and ongoing project controls – our "Big Four".

5.5.2 Register

A schedule of deliverables has been compiled in the MCM (Monitor and Control) and the following incorporated:

- Details of originator, checker, reviewer and independent verifier for each deliverable / work package
- Details of whether deliverables / work packages are technical/non-technical and internal or external

- Details of who can approve deliverables
- Details of third parties

5.5.3 Check, review, verify

In order to maintain quality, we will provide quality management through check, review and independent verification. The exception is that the client technical specialists will provide this verification expertise and function. The steps of quality review would be as follows:

- Self-check
- Project Team Report Review
- Interdisciplinary Review
- Independent Verification including selection of independent verifiers

5.5.4 Approvals

1.1.1.8 Zutari

Approvals will be required from the Project Director prior to issuing of contractual deliverables.

1.1.1.9 Client and other interested parties

The client will give formal feedback at appropriate stages of the project and will also give final approvals via the following methods:

- Verification/Review comments on deliverables
- Final signed acceptance of deliverables by the Client Representative

5.6 Quality assurance

5.6.1 Improvement

The Project Manager will collect lessons learned at the end of each phase of the project and analyze them to identify opportunities for improvement during implementation phase and to avoid the recurrence of problems.

“Lessons learned” resulting in process improvements will be incorporated into the project plan. All revisions to the project plan and other management plans will be issued to project team members for implementation.

5.6.2 Governance reviews

The Project Steering Committee will perform management style reviews at key points during the lifecycle of the project (as part of the monthly performance review). This will include examination of the schedule, project costing, progress, quality management, risk management and so on.

5.6.3 Client satisfaction

The Project Manager has a lead responsibility for eliciting the client’s response and feedback during scheduled project management meetings. Zutari will initiate our on-line client feedback tool.

5.7 Project control and management

5.7.1 General

A formal Monitor, Control and Management worksheet has been established for this project. All project controls will be centralized off this tool.

This will include the following:

- budget control
- forecasting
- earned value
- physical progress measurement
- invoicing

5.7.2 Schedule management

The project schedule (programme) will be managed using Excel (using the MCM).

The Project Manager will have overall responsibility for the preparation and maintenance of the Project schedule

5.7.3 Schedule updates

Physical progress and forecast completion dates of work packages will be assessed on a weekly basis in line with cost control reporting. The Project Schedule will be updated on a monthly basis.

All proposed changes will be assessed for schedule impact during review of those changes. Scope changes will be reflected in the schedule once approved

As the project progresses, it may become necessary to revise the baseline as a result of changes in scope, timing or other influences outside the control of the project. All proposed changes to the schedule baseline will be documented, assessed and approved prior to any adjustment to the baseline being made.

5.8 Document management

5.8.1 Filing system

All project files are to be stored in Sharepoint

The standard Zutari folder structure, as per IMS, will be adopted unless specified otherwise by the client.

5.8.2 Controlled documents

The following documents shall be considered controlled documents:

- External letters and memos
- Technical Reports

Controlled documents shall be:

- Numbered in accordance with Zutari Information Management Standard (IMS)
- Version controlled in accordance with IMS
- Electronically signed by authors, reviewers and approvers as per the schedule of deliverables
- Once approved for issue, Stored in the designated folder in accordance with IMS
- Issued via email

5.8.3 Incoming documents and correspondence

All incoming documents and correspondence from external parties shall be directed to the Project Manager for review and approval before the information is adopted for use or actioned.

Once approved for use, incoming documentation and correspondence shall be stored in the following locations:
- Sharepoint folder

5.8.4 Outgoing documents and correspondence

All outgoing documents and correspondence to external parties shall be approved by the Project Manager before the information is issued.

Approved methods of issue include:
- Controlled documents – Transmittal via email

5.8.5 Internal documents and correspondence

All Work in Progress (WIP) documents shall be located in the project filing system on the Project Sharepoint Folder.

Internal collaboration is encouraged via the following means in order of priority:
- Face to face meetings and workshops (Covid rules permitting)
- Skype/Teams voice calls and instant message
- Email

5.9 Change management

5.9.1 General

A Scope Change is a change to the project baselines for scope, budget, schedule and quality as well as changes to the Scope of Services defined in the agreed Services Agreement between Zutari and the Client.

5.9.2 Change management documents

Types of Change Management documents:
- Change Register – register of all raised changes (in the MCM)
- Change Notice – document use to notify client of any deviation from the current approved scope of services.
- Variation Request – document use to finalise the approved change notice with cost, detailed scope of services, external inputs required, and risk associated with the change, etc. The effect on the schedule dates will also be elaborated in this document.

5.9.3 Change process and status

Any identified change will follow the following stages:

- In Preparation – Change Notice is under development and information is being collected.
- Zutari Review – Change Notice is being reviewed internally.
- Zutari Approved – Change Notice is agreed internally. Cost and time risks to be assessed and updated in project forecasting.
- Client Review – Change Notice is submitted to Client for review and approval.
- Client Approved – change status when Change is approved by client. Budgets, baselines and forecasts to be updated. Variation Request to be submitted.
- Client Rejected – Change is disapproved by client. Cost and time risks to be assessed and updated in project forecasting.
- Cancelled – Change is cancelled. Cost and time risks to be assessed and updated in project forecasting.

5.10 Risk management

5.10.1 General

Risk Management (includes Risk and Opportunity – RO) forms part of the overall Project Plan for the project and consists of the process and timing for identifying and managing risks, mitigation actions required, and organisational responsibility for monitoring and managing the risks throughout the entire lifecycle. This plan provides details of how the risk in the project will be managed and controlled through project execution.

Specific objectives of this project's risk management plan include:

- Identify and assess risks impacting the project objectives are proactively identified, communicated, mitigated, and escalated to the Client in a timely manner.
- Provide opportunities that can reduce schedule, budget, improve quality and performance to the Client

The Project Manager is responsible for ensuring that the risk management process is executed on the project. Project risk workshops

The following project risk workshops and technical risk workshops are planned for the Project:

- Incorporated on the all-formal meetings (both ad-hoc and monthly)

5.10.2 Risk Management process

The risk management process is underpinned by setting context and conducting risk assessments, monitoring risks and reviewing them, recording and reporting risks so they can then be shared. This also provides an ability to communicate and consult with our teams and clients on what matters most for project success. The process is based on ISO 31000 Risk Management Guideline and is as follows:

- Understand project objectives so we can manage what matters most for project success.
- Use a Lifecycle approach for risk assessments including design, construction, commissioning, end user, operations, maintenance, closure.
- Identify risks / opportunities, analyse and evaluate based on impact on the objectives
- Include treatments in the project plan & schedule & cost
- Record & Report – share
- Communicate and collaborate with our clients / stakeholders / team on what is most important

- Monitor and Review for continuous improvement of our project

5.10.3 Risk Management

- The MCM has a Risk Management register. This will be used as the base tool to capture, monitor and close-out risks
- The risk management worksheet will be emailed as a separate sheet to the client as an Annexure to the monthly reports and provide a basis for risk discussions.

6 AGREEMENT WITH THE CLIENT

6.1 Deliverables

The following are the deliverables for this contract:

- Inception Report
- Status quo Reports for both KwaDukuza and Mandeni Municipalities
- Non-Revenue Electricity Strategies (Technical, Financial, Institutional, and Social Interventions Strategies and Initiatives report), one for each Municipality
- Consolidated Comprehensive Management Plans to Reduce Non-Revenue Electricity, one each for KwaDukuza and Mandeni Municipalities
- Close-out Report

6.2 Client Tasks

- Constitute the monthly meetings
- Technical review and verification
- Coordination and assistance with stakeholder engagement
- Provision of data as required in the Request for Information
- Progress assessment and resolution of consultant invoice payments

6.3 Programme, Milestones and Costing

This section provides the project programme of the contract, illustrating the main tasks and timeframes to complete the tasks as well as agreed costing. Table 6 Provides a summary of tasks, completion dates, milestone indicators and costing.

Table 6 Main Project Tasks, Estimated Completion Dates and Costing

No.	Deliverables	Date	Milestone	Vat inclusive
1	Inception Report, three hard copies, one electronic copy.	25/11/21	Yes	R 111,660.46
2	Status Quo Reports for KDM and MLM, one electronic copy per municipality, including all supporting GIS, CAD and electronic information. (drafts in MS Word Format are required to be circulated for ease of commenting and contribution)	15/02/22	Yes	R 167,043.85
3	Two Non-Revenue Electricity Strategies (Technical, Financial, Institutional, And Social Interventions Strategies and Initiatives report) for KDM and MLM, one electronic copy per municipality.	14/03/22	Yes	R 272,421.34

4	Two Consolidated Comprehensive Management Plans to Reduce Non-Revenue Electricity for KDM and MLM, three hard copies for each municipality, one electronic copy, including all supporting GIS, CAD and electronic information.	25/04/22	Yes	R 154,616.88
5	Four (4) virtual Workshops to with IDM and KDM officials (Two during Status Quo Stage and two to formulate the NRE Technical, Financial, Institutional, And Social Strategies and Initiatives	TBD	No	R 44,400.00
6	Attendance of monthly progress meetings and provision of meeting notes.	Monthly	No	R 55,500.00
7	Submission of weekly electronic progress notes	Weekly	No	R 11,100.00
8	Close-out report, three hard copies, one electronic copy.	30/04/22	Yes	R 33,300.00
9	Presentation to the Project Steering Committee, one electronic copy.	TBD	No	R 16,650.00
10	Presentation to ManCOs of each municipality, one electronic copy.	TBD	No	R 16,650.00
	Total Fee			**R 883,342.53**

6.3.1 Detailed Draft Program

Task no	Task Descriptions	22-Nov	29-Nov	06-Dec	13-Dec	20-Dec	27-Dec	03-Jan	10-Jan	17-Jan	24-Jan	31-Jan	07-Feb	14-Feb	21-Feb	28-Feb	07-Mar	14-Mar	21-Mar	28-Mar	04-Apr	11-Apr	18-Apr	25-Apr	02-May
		Weeks																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	**Task 1: Inception**																								
1.1	Internal Project Kick-off																								
1.2	Literature Review and Research - scoping																								
1.3	Client Inception workshop																								
1.4	Ratify strategic objectives																								
1.5	Develop specific approach																								
1.6	Situational Analysis Criteria																								
2	**Task 2: Status Quo**																								
2.1	Situational Analysis Assessment - people, systems, resources, and organizational and extraneous factors)																								
2.2	Map out the revenue																								

	management value chain																								
2.4	Develop a problem tree per sector																								
3	**Task 3: Formulation of Initiatives**																								
3.1	Situational Analysis Assessment - people, systems, resources, and organizational and extraneous factors)																								
3.2	Developing a theory of change - benefits and outcomes																								
3.3	Develop a results chain per sector																								
3.4	Identify key attributes to the outcomes (what, when, where, how, why and who)																								
3.5	Develop the success criteria per outcome																								
3.6	Prioritization of outcomes																								
3.7	Risk and mitigations measures - develop risk management plan																								
4	**Task 4: Develop Comprehensive**																								

	Management Programme Plan																							
4.1	Review the success criteria in terms of assumptions and risks																							
4.2	Assess Program factors																							
4.3	Assess nonprogram external factors																							
4.4	Test assumptions with stakeholders																							
4.5	Programme specific research																							
4.6	For the outcomes success criteria, specify indicators and data sources																							
4.7	Compile Programme framework for achieving the outcomes																							
5	**Meetings and Engagement**																							
5.0	Inception Meeting																							
5.1	Monthly progress meetings																							
5.2	Virtual Workshops																							
5.3	Formal Presentations of MP																							
5.4	Presentations to Mancos																							

6	**Contingency Float**																								
6.1	Program float																								

7 CONCLUSION AND ISSUES TO BE RAISED

7.1 Conclusion

The objective of this project is to identify revenue losses and to implement strategies to improve revenue income for the municipalities. The success of this project lies within the combined co-operation of all stakeholders involved. Communication plays an important role and Zutari will co-ordinate this aspect.

7.2 Matters to be resolved

Outstanding information as per list provided and who in each municipality per division is the responsible person

7.3 Proposed Progress Meeting Dates

It is proposed monthly progress meetings occur, as tabled below, in order to update project progression and align all stakeholder to the status of the project, adhoc meetings can be implemented when required.

PROPOSED PROGRESS MEETINGS		
No.	**Date**	**Alternate Date**
Meeting 1	11-Feb-22	15-Feb-22
Meeting 2	01-Mar-22	08-Mar-22
Meeting 3	01-Apr-22	05-Apr-22
Meeting 4	22-Apr-22	30-Apr-22

8 RECOMMENDATIONS

It is recommended that the time schedule be accepted as is and is dependent on responsible municipal staff availability.

ANNEXURE 1

Letter of Award

MARISWE
IMPROVING LIVES ENGINEERING SOLUTIONS

Block 1, Suite 201, Monument Office Park, 79 Steenbok Avenue, Monument Park, Pretoria, 0181, South Africa
P O Box 25549, Monument Park, Pretoria 0105, South Africa
Tel: +27 (0)12 424 9700 pretoria@mariswe.com
Mariswe (Pty) Ltd Reg. No. 1995/009872/07
www.mariswe.com

Transportation \ Water \ Structures \ Management Services \ Infrastructure Planning

Enquiries: S Munnik
Telephone: 012-424-9707
Email: sandram@mariswe.com

Date: 13 October 2021
Your Ref:
Our Ref: 27830 VILP/I/033

PROJECT 27830

ILEMBE LED PROGRAMME

NOTICE OF TENDER AWARD

The Vuthela iLembe LED Programme makes notice to award for the following tender:

CONTRACT NO: VILP/I/033

DESCRIPTION: DEVELOPMENT OF NON-REVENUE ELECTRICITY MANAGEMENT STRATEGIES AND PROGRAMMES FOR THE KWA-DUKUZA AND MANDENI MUNICIPALITIES

AWARDED CONSULTANT: ZUTARI (PTY) LTD AT A VAT INCLUSIVE PRICE OF ZAR R883 342.53

CONTRACT PERIOD: COMMENCEMENT: ON SIGNING OF CONTRACT BY BOTH PARTIES

CONCLUSION: 30 APRIL 2022

S MUNNIK
Divisional Head – Infrastructure Planning
Mariswe (Pty) Ltd
Vuthela iLembe LED Programme

2021.10.12
Date

Statutory Directors: Govender K; Modiko, K; Msomi MR; Naidoo Y; Sindane TN; Skea AD; Uys LJ
Quality Control Document Reference: CM_03_02B | Revision No. 06 | 04/10/2021

ANNEXURE 2

Terms of Reference (Inclusive of NRE Management Strategies Tender Document and the FIDIC Professional Services Contract)

ANNEXURE C – D2: SITUATIONAL ANALYSIS & STATUS QUO REPORT

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

edtea
Department : Economic Development, Tourism and Environmental Affairs
PROVINCE OF KWAZULU-NATAL

ILEMBE DISTRICT MUNICIPALITY
ILEMBE UMASIPALA WESIFUNDA

KWADUKUZA MUNICIPALITY

MANDENI MUNICIPALITY

Vuthela
ILEMBE LED PROGRAMME

ZUTARI
IMPACT. ENGINEERED.

STATUS QUO REPORT – KWADUKUZA LOCAL MUNICIPALITY (KDM)

Project Title: Development of Non-Revenue Electricity Management Strategies and Programmes for KwaDukuza & Mandeni Municipalities

Contract No.: VILP/I/033

Date: 29/06/2022

Version 2

Prepared By:

Leon Prinsloo	
Prasun Seebran	
Martin Piper	

Contents

Acronyms and Abbreviations

ABBREVIATION	DESCRIPTION
AMIS	Asset Management Information System
AMR	Automatic Meter Reading
CRM	Customer Relationship Management
CT	Current Transformer
DBSA	Development Bank of Southern Africa
DMRE	Department of Minerals & Energy
EMP	Electricity Master Plan
FY	Financial Year
FAR	Fixed Asset Register
GIS	Geographic Information System
GPS	Global Positioning System
HEU	High End User
HUC	High Use Customers
HV	High Voltage
ICT	Information and Communication Technology
IDM	iLembe District Municipality
IDP	Integrated Development Plan
IT	Information Technology
KDM	KwaDukuza Local Municipality
kVA	Kilo Volt-Ampere
kWh	kilowatt-hour
LPU	Large Power User
LV	Low Voltage
MMS	Meter Management System
MLM	Mandeni Local Municipality
MIS	Management Information System
mSCOA	Municipal Standard Chart of Accounts
MTSF	Medium Term Strategic Framework
MV	Medium Voltage
MW	Mega Watts
NT	National Treasury
NTL	Non-Technical Losses
NRE	Non-revenue electricity
NRS	National Regulatory Services

PCU	Vuthela Programme Coordinating Unit
PFM	Public Finance Management
PILC	Paper insulated lead covered
POD	Point of Delivery
POS	Point of Supply
PSP	Professional Service Provider
RMSP	Remote Meter Service Provider
SCADA	Supervisory Control and Data Acquisition
SDF	Spatial Development Framework
SLD	Single Line Diagram
SPU	Small Power User
STS	Standard Transfer Specification
TAR	Technical Asset Register
TID	Token Identifier
TL	Technical Losses
ToR	Terms of Reference
TOU	Time of Use
VT	Voltage Transformer
WBG	World Bank Group

1 EXECUTIVE OVERVIEW

This report is the second phase of the Vuthela iLembe LED Programme's Development of Non-Revenue Electricity Management Strategies and Programmes for the KwaDukuza and Mandeni Local Municipalities.

The deliverable requires two Status Quo reports to be provided, one each for KwaDukuza and Mandeni Local Municipalities.

This Status Quo report is for the KwaDukuza Local Municipality (KDM).

The report describes the various structures, systems and data-related activities and identifies possible gaps where energy losses / revenue losses may occur. This report focuses on the analysis of the current situation and reporting on the status quo thereof. Recommendations and suggestions for initiatives and intervention to address these losses will form part of phase 3.

The report is structured as follows:

- High-end Summary of required deliverables
- Report on Stakeholder Workshop session
- Detailed assessment of each deliverable and identification of gaps.

2 REQUIRED DELIVERABLES

Phase two involves the study, review, and assessment (Situational Assessment) of a host of aspects, covering the full spectrum of energy sourcing, distribution, revenue collection and debt management.

The various aspects can be summarized in below table as a high-end summary. Each aspect contains several sub-aspects that will be highlighted in the detailed Sections.

Table 1:High end summary of deliverables

1	Existing Infrastructure assessment
2	Technical Losses
3	Non-Technical Losses
4	Community / End-user awareness & campaigns

The situational analysis will comprise of:

- Assessment of documents / reports / data etc. The various detailed sections will highlight the applicable information that was assessed.
- A Stakeholder workshop with the relevant stakeholders of the KwaDukuza Local Municipality.

3 STAKEHOLDER WORKSHOP

In order to determine the Status Quo of the KDM municipality, a workshop was held on the 17th February 2022 with the relevant stakeholders from both the municipality and Vuthela.
The purpose of the workshop was to determine which information Zutari had already acquired and what information would be required from the relevant stakeholders to attain a thorough understanding of the situational analysis of the municipality.
The following list of stakeholders attended the workshop:

Table 2: ***Stakeholder list***

Full Name	Organisation	Department	E-mail
Martin Piper	Zutari	Electrical	Martin.Piper@zutari.com
Umeshan Pillay	Zutari	Electrical	Umeshan.Pillay@zutari.com
Munya Mutyora	Vuthela	Infrastructure	munyam@vuthelaled.co.za
Zafika Ngubane	KDM	IDP & Public Participation	ZafikaN@kwadukuza.gov.za
Sibusiso Jali	KDM	Electrical	SibusisoJ@kwadukuza.gov.za
Duma Mhaule	KDM	Electrical	DumaM@kwadukuza.gov.za
Krishen Kemi	KDM	Finance	Krishenk@kwadukuza.gov.za
Shamir Rajcoomar	KDM	Finance	Shamirr@kwadukuza.gov.za
Thandiwe Gumede	KDM	Finance	Thandiweg@kwadukuza.gov.za

The aspects covered and workshopped were placed into four deliverable categories as per the ToR. These deliverables were given as follows:

- Existing Infrastructure Assessments
- Technical Losses
- Non-Technical Losses
- Community Awareness and Behaviours

Zutari summarized the purpose of the workshop, key outcomes and deliverables with the relevant stakeholders as follows:

- In order to acquire an accurate understanding of the systems in place there is the requirement to gather as much information from all the relevant departments as possible, bearing in mind the more data forthcoming, the more accurate the outcomes will be.

- Numerous aspects, ranging from the status of the existing electrical infrastructure and its performance to the public participation and current awareness campaigns on the go, installed metering and meter reading, effectiveness of financial systems, customer databases, tariffs etc were requested.

These items were expanded on in greater detail and summarised in the tables throughout this document with the relevant department sources categorised for easy identification and allocation. The reference material received at the time of the workshops was also identified.

4 DETAILED SITUATIONAL ASSESSMENTS

This section highlights in more detail the 4 deliverables as highlighted in the high-end Deliverables Requirement Summary in section 2.

It highlights the sub-aspects in detail, the documents / reports / data applicable to the assessment of the deliverable (reference information), and the gaps (if any) identified.

Where information was requested but not received, it is assumed that the information was not available.

4.1 Existing Infrastructure Assessment

4.1.1 Overview

The TOR for this section read as follows:

"The consultant will be required, amongst other activities, to obtain all relevant information, as-built drawings, asset details, etc. of the electricity infrastructure network and associated facilities and carry out necessary consultation to:

I. Confirm and validate the existence of key network installations.

II. Obtain a general assessment of the entire electricity infrastructure network in the Municipalities through a desktop study to establish the composition, age, quality, general condition, and network modelling thereof using available information or, in the absence of such available information, conducting the assessments. The municipalities' electricity masterplans, GIS Databases, fixed asset registers, asset management plans and any other relevant documentation should be consulted for this purpose,

III. Obtain a general assessment of the status, frequency, and adequacy of metering and meter readings for bulk purchases and high usage consumers in the municipal area.

IV. Identify and assess the existing roles and responsibilities and the effectiveness thereof, regarding the provision of electricity services in the municipality including associated responsibilities such as meter readings, revenue collection, operations and maintenance of electricity services infrastructure, etc.

V. Assess the adequacy and currency of the by-laws, policies, tariff setting, asset management planning, and budgeting for operations and maintenance by the municipality in relation to the sustenance of electricity services provision and its associated infrastructure.

VI. A Scoping study for an Asset Management Information System, and a functional design and specification for the SCADA System & Control Room were completed under the inception phase of the Vuthela Programme. The PSP is to familiarise themselves with these studies and use those for reporting on the current technical management

4.1.2 Detailed Deliverable Breakdown

The table below provides a detailed breakdown of the 6 aspects assessed as per the ToR and the Reference information used in the assessments.

Aspect III was sub-divided into a) Bulk purchases and b) High usage customers. Aspect IV was also sub-divided into a) Asset Management Information System and b) SCADA system and control room.

Codes have been assigned to indicate whether Reference Information is according to the ToR (**T**), Additional Information received (**A**) or Zutari requested (**Z**).

The source field indicates from which department the information was sourced and the received column indicates whether the information was received or not.

Certain Reference Information documents are applicable to more than one of the assessment aspects.

Table 3: Breakdown of Deliverables as per TOR

Number	Assessment Item	Reference Material	Source
1.1	Confirm & validate key network installations	Electricity Master Plans **(T)**	Energy
		As built drawings **(T)**	Energy
		Fixed asset register **(T)**	Energy
		Asset Management plan(s) **(T)**	Any
		KDM IDP **(T)**	Any
		KDM Energy losses & action plan report **(A)**	Any
		Loading data **(Z)**	Energy
		Maintenance & failure percentage per feeder. **(Z)**	Energy
		Feeder metering data per load point **(Z)**	Energy
		Existing Network model **(Z)**	Energy
		Previous Assessment reports & initiatives to reduce losses **(T)**	Any
1.2	Desktop Study entire electricity network to determine: - Composition - Age - Quality - Network modelling	Electricity Master Plans **(T)**	Energy
		As built drawings **(T)**	Energy
		Fixed asset register **(T)**	Energy
		Asset Management plan(s) **(T)**	Energy
		KDM IDP **(T)**	Any
		KDM Energy losses & action plan report **(A)**	Any
		KDM NERSA D forms **(A)**	Energy
		KDM distribution losses report 2018-2019 **(A)**	Energy
		KDM Energy Revenue Enhancement programme 09-2020 **(A)**	Energy
		KDM Energy Losses report 2020 **(A)**	Energy
		Existing network model **(Z)**	Energy
		Supply areas **(Z)**	Energy

		Outage statistics **(Z)**	Energy
		ESKOM account & billing data **(Z)**	Energy
1.3.A	Undertake general assessment of Metering & Meter Reading for bulk purchases	Detailed POD information (metering diagrams, CT /VT data etc) **(Z)**	Energy
		POD sub-metering? **(Z)**	Energy
		High end user list **(Z)**	Any
1.3.B	Undertake general assessment of Metering & Meter Reading for high use customers	AMR PSP? **(Z)**	Energy
		AMR data **(Z)**	Any
		AMR fault list (Z)	Energy
		Department organograms? (Z)	Any
1.4	Assess existing roles & responsibilities & effectiveness of: - Provision of electrical services in general - Meter readings - Revenue collections - Operations & maintenance of electricity services in general	Vacancies? **(Z)**	Any
		Meter reading outsourced / internal? **(Z)**	Finance
		Credit control outsourced / internal? **(Z)**	Finance
		Ops & maintenance team composition **(Z)**	Energy
		Electricity by-laws **(Z)**	Energy
1.5	Assess adequacy & currency of: - By-laws - Policies - Tariff setting - Asset Management planning - Budget for maintenance & planning	Policies (SSEG / Disconnection & Rev Protection policy) **(Z)**	Energy
		Tariff setting policy (Z)	Any
		Revenue Management policy **(Z)**	Any
		Asset Management policy **(Z)**	Any
		Asset Management plan & 3 - 5 year rolling maintenance plan **(Z)**	Any
		Ops & Maintenance budgets **(T)**	Any
		Vuthela scoping study for AM Information System **(T)**	Vuthela
1.6.A	Assess Scoping Study for Asset Management Information System	Applicable procedures **(Z)**	Any
		AM system information **(Z)**	Any
		Vuthela functional design & specification for SCADA system & Control room **(T)**	Vuthela
1.6.B	Assess Functional Design & Specification for SCADA System & Control room	Network operational diagrams **(Z)**	Energy
		Validation & process for managing normal open points **(Z)**	Energy

4.1.3 Situational Analysis Findings

This section outlines Zutari's detailed Status Quo Assessments findings.

4.1.3.1 Key Network Installations

Reference information received in this regard, consists of:

- Electricity Master Plans
- Network Drawings
- GIS data for electrical infrastructure
- IDP 2021/22

The KwaDukuza Municipality has two licensed electricity distributors, namely Eskom and KwaDukuza. KwaDukuza has no generation capacity and buys its electricity from Eskom and resells it to customers within their licensed area. Most of the municipality is supplied by KwaDukuza as per Figure 1 below. Whereas ESKOM supplies electricity directly to Wards 1, part of ward 2, part of ward 3, part of ward 21, ward 25, and part of 27 with the rest of the Wards supplied by the Municipality.

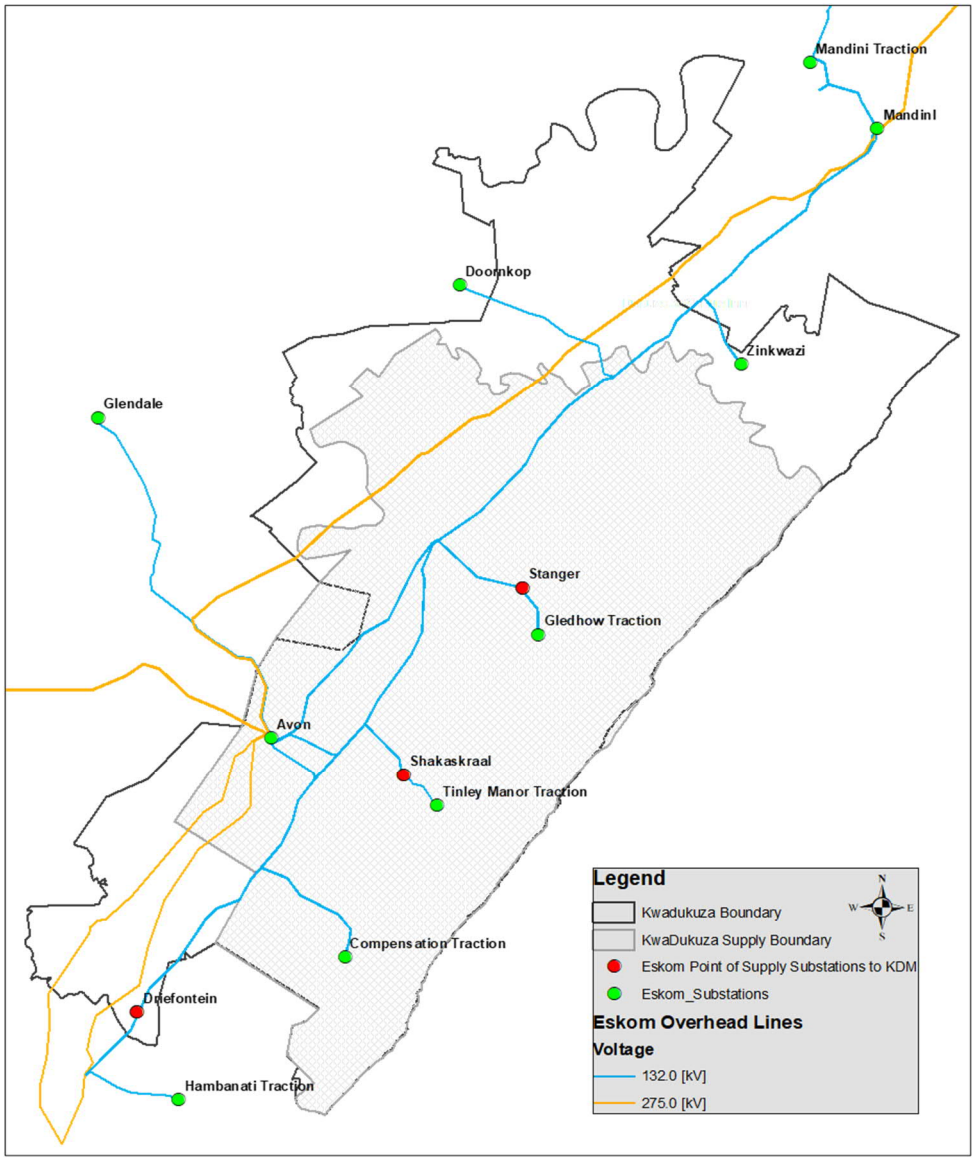


Figure 1: Eskom Bulk Infrastructure & Point of Supplies

4.1.3.1.1 Bulk Supply System

The electrical network hierarchy for Kwadukuza is shown in Figure 2 below. The bulk supply at the highest level is Eskom Avon 275kV / 132kV Main Transmission Substation. There are two circuits north to Stanger (Avon – Stanger lines 1 and 2) and two circuits south to Driefontein (Avon Driefontein lines 1 and 2) that form part of the Transmission network supplying Eskom substations. In turn, these Eskom substations supply Kwadukuza 33kV intake substations or switching stations.

Kwadukuza 33kV Distribution substations then supply 11kV switching stations, miniature substations, and ground and pole mount transformers through 11kV network feeders. The 11kV switching substations in turn supply additional miniature substations and transformers as well as large power users in some instances at 11kV. The miniature substations and transformers then supply reticulation zones to LV customers.

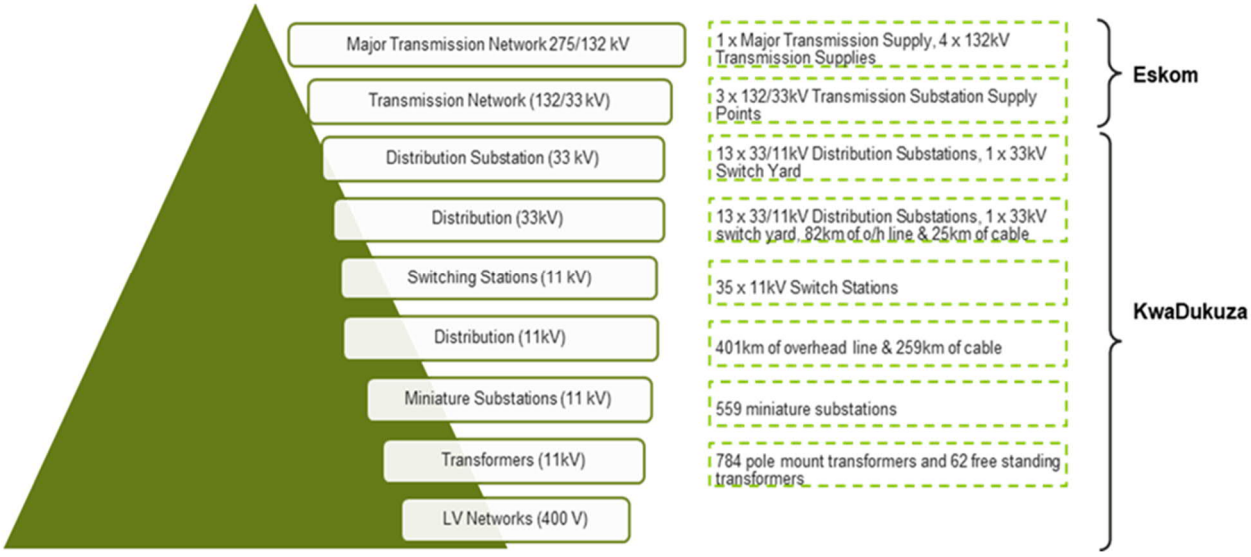


Figure 2: Network Hierarchy

KwaDukuza takes bulk supply from Eskom at three points of supply which are summarised in Table 4 below along with the contracted notified maximum demand at each point. The Avon Stanger lines supply Eskom Stanger and Shakaskraal substations and the Avon Driefontein lines supply Eskom Driefontein substation.

Table 4: Bulk supply from Eskom at three points to KwaDukuza

Eskom Point of Supply	Supply Voltage	Substation Firm Capacity	Notified Maximum Demand
Stanger	33kV	80MVA	75MVA
Shakaskraal	33kV	40MVA	47MVA
Driefontein	33kV	40MVA	30MVA

4.1.3.1.2 33kV System

The bulk supply from Eskom is received and distributed at 33kV by the municipal network and is then transformed to 11kV at 13 distribution substations as outlined in Table 5 below. In addition to this, there is one standalone 33kV Switchyard in the Northern region. The municipality is organisationally

divided into two areas, namely the Northern region, and Southern region. The Northern region is supplied from Stanger substation and the Southern region is supplied from Shakaskraal and Driefontein substations.

Table 5: 33kV Substations

Substation	Region	Transformer	Install Capacity (MVA)	Firm Capacity (MVA)
Ballito	South	3 x 33/11kV, 10MVA	30	20
Business Park	South	4 x 33/11kV, 10MVA	40	30
Chakasrock	South	2 x 33/11kV, 10MVA	20	10
Gledhow	North	1 x 33/11kV, 5MVA	5	0
Glenhills	North	2 x 33/11kV, 10MVA	20	10
Groutville P1	North	2 x 33/11kV, 10MVA	20	10
Imbonini	South	2 x 33/11kV, 10MVA	20	10
Industrial	North	3 x 33/11kV, 10MVA	30	20
Lavoipierre	North	3 x 33/11kV, 10MVA	30	20
Sappi	North	3 x 33/11kV, 15MVA	45	30
Shakaskraal	South	3 x 33/11kV, 10MVA	30	20
Sheffield	South	2 x 33/11kV, 10MVA	20	10
Zimbali	South	3 x 33/11kV, 10MVA	30	20
Stanger POS	North	None	N/A	N/A

The 33kV network is constructed with a mix of overhead lines, strung with either Oak or Poplar conductor (on wood pole or concrete pole structures) or underground cable (XLPE & Aluminium, between 95mm^2 and 300mm^2).

From the Geospatial network information on the 33kV network, there is approximately 82 km of overhead line (route length) and 25 km of cable (cables that are laid double are calculated as total length i.e., 5km of 2x95mm^2 route length is calculated as 10km of cable). Figure 3 below is a graphical representation illustrating the extent of the 33kV networks and connection to Eskom infrastructure.

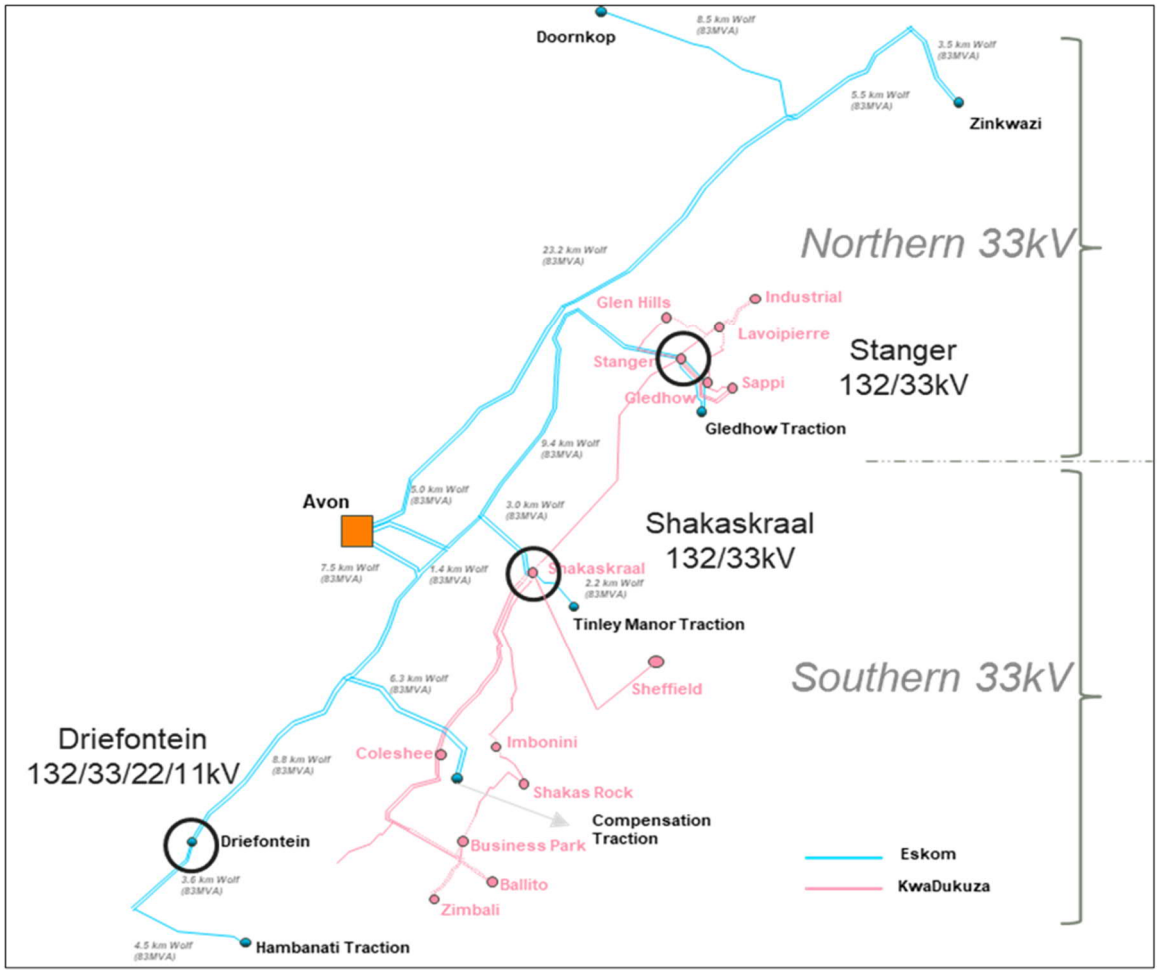


Figure 3: Eskom Bulk infrastructure & KDM 33kV Distribution Infrastructure

The extent of the 33kV feeders is noted below,

Table 6: 33 kV feeders North and South

33kV Feeders South	33kV Feeders South	33kV Feeders North
1. 33kV Driefontein 1	16. 33kV Imbonini 1 Shakasrock	1. 33kV Stanger 1 Lavoipierre
2. 33kV Driefontein 2	17. 33kV Sheffield 1 Mount Richmore (Future)	2. 33kV Stanger 2 Lavoipierre
3. 33kV Shakaskraal 1 Imbonini	18. 33kV Sheffield 2 Mount Richmore (Future)	3. 33kV Stanger 3 SAPPI
4. 33kV Shakaskraal 2 Sheffield	19. 33kV Dukuza 1 Shakaskraal (Future)	4. 33kV Stanger 4 SAPPI
5. 33kV Shakaskraal 3 Sheffield	20. 33kV Dukuza 2 Shakaskaal (Future)	5. 33kV Stanger 5 Gledhow
6. 33kV Shakaskraal 4 Interconnector	21. 33kV Dukuza 3 Ballito (Future)	6. 33kV Stanger 6 Glenhills
7. 33kV Shakaskraal 5 Interconnector	22. 33kV Dukuza 4 Zimbali (Future)	7. 33kV Stanger 7 Priority 1
8. 33kV Shakaskraal 6 Ballito	23. 33kV Dukuza 5 Spare (Future)	8. 33kV Stanger 8 Blythedale
9. 33kV Shakaskraal 7 Zimbali	24. 33kV Dukuza 6 Spare (Future)	9. 33kV Lavoipierre 1 Gledhow
10. 33kV Shakaskraal 8 Gizenga		10. 33kV Lavoipierre 2 Industrial

11. 33kV Shakaskraal 9 Palm Lakes (11kV Operated)		11. 33kV Glehills 1 Industrial
12. 33kV Shakaskraal 10 Palm Lakes (11kV Operated)		12. 33kV SAPPI 1 Gledhow
13. 33kV Zimbali 1 Business Park		13. 33kV Priority 1 Gizenga
14. 33kV Business Park 1 Ballito		14. 33kV Industrial 1 Blythedale (Future)
15. 33kV Business Park 2 Shakasrock		15. 33kV Industrial 2 Blythedale (Future)

4.1.3.1.3 11kV System

The 11kV network is constructed with a mix of overhead lines, strung predominantly with Pine conductor as well as Oak on wood pole structures, and underground cable, PEX, Aluminium and PILC, between 25mm2 and 150mm2. From the Geospatial network information on the 11kV network, there are approximately 401 km of overhead line and 259 km of cable. Figure 4 provides a geographic representation of the extent of the 11kV system in KwaDukuza.

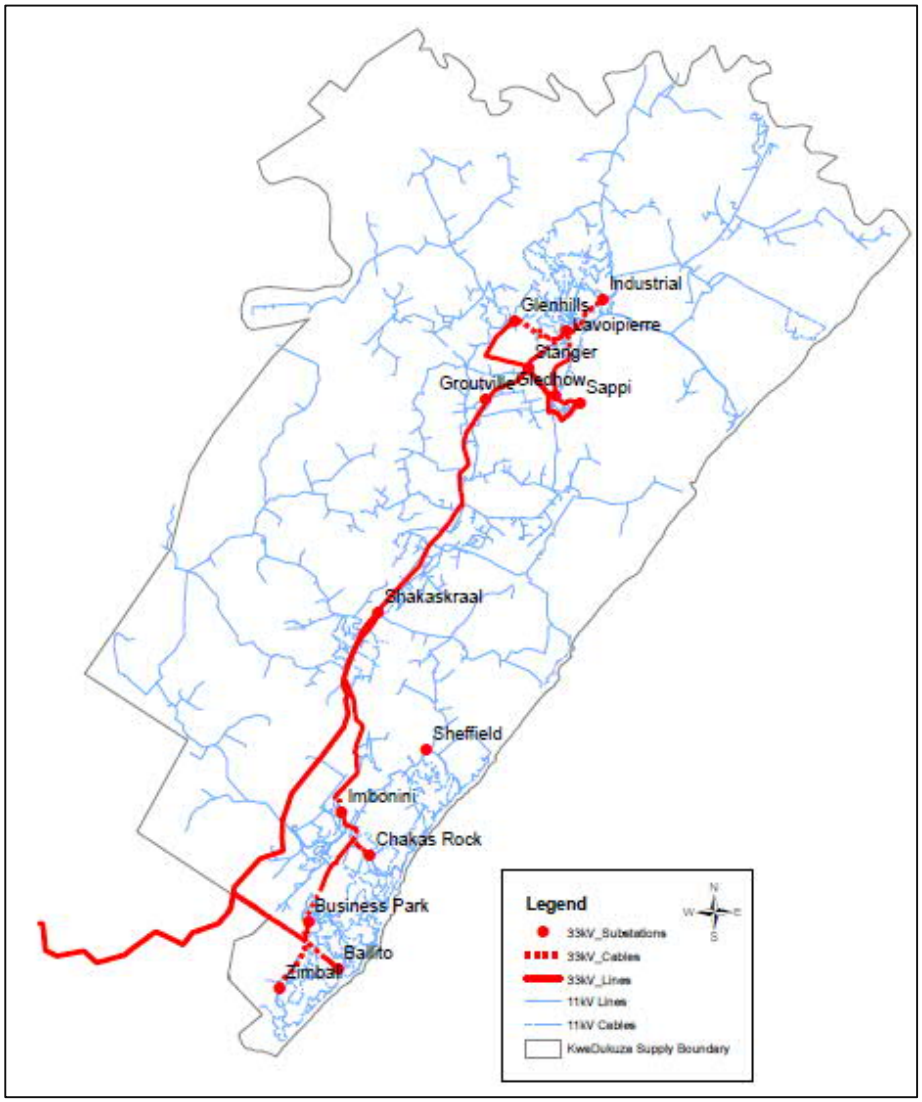


Figure 4: Spatial representation of the extent of the 11kV system in KwaDukuza

The 11kV network includes a range of key switching stations across the Northern and Southern regions of KwaDukuza and is tabled below. These switching stations are supplied from the 33/11kV substations and in most instances interconnected to increase network reliability.

Table 7: 11kV Switching Substations

11kV Switch Stations North	11kV Switch Stations South	11kV Switch Stations South
1. Bilkus Street	13. Ashley Road	25. Marion Road
2. BW Charles	14. Ballito Bay Mall	26. Nkobongo
3. CBD	15. Ballito Junction	27. Peter Hulett
4. Flamboyant Drive	16. Ballito Lifestyle Centre	28. Promenade
5. Hesto	17. Ballito Manor Estate	29. Seaward Estate Gate House
6. Hydrangea Road	18. Ballito Hills	30. Thompsons Bay
7. I D C	19. Bogmore Park	31. Tiffany's shopping centre
8. Magic Tissue	20. Etete West	32. V. M. H.
9. Melville	21. Extention 5	33. Village
10. Saunders Street	22. Fire Station	34. Woodmead
11. Townview	23. Hampshire Hotel	35. Zimbali 1
12. KwaDukuza Mall	24. Hewitt Road	36. Zimbali 2

The reticulation transformers across the network as of 2019 are categorised as,

1. 315kVA, 500kVA mini substations with a total of 559.
2. 16kVA, 50kVA, 100kVA, 200kVA pole-mounted transformers with a total of 784.
3. 200kVA, 500kVA, 800kVA, 1MVA ground mount transformers with a total of 62.

4.1.3.2 General Infrastructure Assessment

Reference information received in this regard, consists of:

- Electricity Master Plans
- Asset Register and Asset Verification Data

It can be noted that the KwaDukuza Distribution networks have been in service for many years and much of the network is aged. Such networks may begin to exhibit degradation in reliability, performance, and functional inadequacy.

The infrastructure assessment is based on available information from previous Master planning and Asset Verification projects conducted between the period of 2016 – 2019. The recent Master Plans include field inspections across the 33/11kV Distribution substations. Asset inspections conducted in 2016 as part of the Asset Verification Project include high-level condition equipment ratings for downstream infrastructure such as switch rooms and distribution devices. The current asset register does not have a consistent naming convention to identify electrical assets with limited condition ratings across equipment. Conditional assessments of the 33kV and 11kV lines and cables have not been included as no previous assessments provide detail around these assets. The KDM 11kV overhead networks are typically replaced or refurbished as part of their MV Upgrade projects on a yearly basis.

4.1.3.2.1 33kV Substations

A condition assessment was done during the 2019 Master Plan based on visual inspection and the substation equipment has been categorised with an assessment rating as tabled below.

Table 8:Condition Ratings

Rating	Condition	Description
5	Excellent	No visible defects; new or near new condition; may still be under warranty if applicable
4	Good	Good condition, but no longer new; may have some slightly defective or deteriorated component(s), but is overall functional
3	Adequate	Moderately deteriorated or defective components, but has not exceeded useful life
2	Marginal	Defective or deteriorated component(s) in need of replacement; exceeded useful life
1	Poor	Critically damaged component(s) or in need of immediate repair; well past useful life

Table 9 overleaf provides a general assessment of the equipment and condition at each of the 33kV distribution substations. The ratings provided are based on the 2019 Master Plan assessment. KwaDukuza Distribution networks have been in service for many years and much of the network is approaching its design life. Such networks may begin to exhibit degradation in reliability, performance, reduced safety margins, functional inadequacy, or general deterioration.

Table 9: Substation General assessment

Substation Name	Estimated Age	Transformer Average Rating	33kV Breaker Average Rating	11kV Breaker Average Rating	Condition Comments
Ballito	35	4	3	3	• This substation falls within the adequate to good range illustrating overall functionality with some deteriorated equipment. • Transformer 1 is 35 years old and transformer 3 is 23 years old however still in fair condition based on inspection rating. • Outdoor CTs are aged 35 years old.
Business Park	16	3	4	4	• This substation falls within the adequate to good range which is expected based on the age. • A transformer rating of 3 illustrates a need for maintenance as it is still approaching midlife. • Transformer Bay 4 is relatively new under 5 years triggered by developments in the area.
Chakasrock	35	3	3	3	• This substation falls within the adequate range which is in line with the age. It is functional however deteriorated and in need of refurbishment and replacement of equipment such as relays. • The transformer rating is expected based on age. The 2019 master plan indicates that these transformers were refurbished in recent years.
Gledhow	35	2	2	3	• This substation falls within the adequate range and has equipment that is both defective and in need of replacement. • The 11kV switchgear is aged and of the Oil type which is a safety hazard and should be replaced. • The transformer is in poor condition and in need of refurbishment or replacement.
Glenhills	30	4	3	3	• This substation falls within the adequate to good range illustrating overall functionality with some deteriorated equipment which is expected for the age. • Transformer 2 is 30 years old but in fair condition based on the inspection rating.
Groutville P1	5	5	5	5	• This substation falls within the excellent range which is expected to be a relatively new substation.
Imbonini	13	3	4	4	• This substation falls within the adequate to good range illustrating overall functionality with minor defects that can be addressed through maintenance.

Industrial	25	5	4	3	• This substation falls within the good rating illustrating overall functionality. • Transformers 1 & 2 were replaced in 2014 thereby indicated as excellent as it is relatively new • Transformer 3 bay is new and was installed in 2021 • There are however aged 33kV and 11kV switchgear since the establishment of the substation approaching useful life.
Lavoipierre	36	3	4	3	• This substation falls within the adequate rating illustrating that equipment has deteriorated with a need for refurbishment and replacement. • The transformers are 36 years old therefore reaching useful life. • 33kV outdoor breakers have been replaced in the past and are therefore in good condition. • The 11kV switchgear is aged and of the Oil type which is a safety hazard and should be replaced.
Sappi	45	3	3	N/A	• This substation falls within the adequate rating illustrating that equipment has deteriorated with a need for refurbishment or replacement. • The transformers are over 40 years old and reached useful life. • The 33kV outdoor equipment is aged typically over 25 years old and in need of replacement.
Shakaskraal	26	3	5	3	• This substation falls within the adequate to excellent range. This is because this substation was expanded around 2013 and additional 33kV indoor breakers and a transformer were installed. • Two of the existing transformers are 15 years old and the third is around 9 years old. The assessment rating of 3 indicates a need for maintenance and general refurbishment. • The 33kV indoor breakers were part of the expansion and are still in excellent condition. • The 11kV switchgear is around 10 years old and considered to be in fair condition with useful life.
Sheffield	8	3	5	5	• This substation falls within the good to excellent range which is in line with age. • The transformers are 8 years old however fall within the marginal to adequate range which indicates a need for refurbishment.
Zimbali	16	3	3	3	• This substation falls within the adequate rating illustrating that equipment has deteriorated with a need for refurbishment.

Based on the substation ratings illustrated within Table 9 it can be noted that the substations are typically in an Adequate to Good condition based on the assessments conducted within the Master Plan projects. The exception is however Gledhow substation which falls within the Marginal rating.

4.1.3.2.2 11kV Switch Stations

The 11kV switch stations were not assessed in detail during the 2019 master plan and Zutari has therefore utilised data captured in 2016 as part of the Asset Verification Project that was conducted. This assessment provides high-level equipment conditions of these switching stations at the time and a condition rating has been identified using this data and aligned to the rating description provided in Table 8.

Table 10: 11 kV Switching Station General Assessment

11kV Switch Station Name	Estimated Age	Condition	Comments
Bilkis Street	-	Marginal	Several 11kV oil circuit breakers were rated in the replacement category
BW Charles	-	Marginal	Several 11kV oil circuit breakers were rated in the repair/replacement category
CBD	8	Good	Switch station established in 2013
Flamboyant Drive	-	Marginal	Several 11kV oil circuit breakers were rated in the repair/replacement category
Hesto	8	Good	Switch station established in 2013
Hydrangea Road	-	Good	Switch station refurbished in 2013
I D C	-	Marginal	Several 11kV oil circuit breakers were rated in the repair/replacement category
Magic Tissue	-	Marginal	Several 11kV oil circuit breakers were rated in the repair/replacement category
Melville	-	Adequate	Requires refurbishment which was partly done since the Groutville substation project
Saunders Street	8	Good	Switch station established in 2013
Townview	-	Marginal	Several 11kV oil circuit breakers were rated in the repair/replacement category
Ashley Road	-	Marginal	Several 11kV oil circuit breakers were rated in the repair/replacement category
Ballito Junction	-	Adequate	
Ballito Lifestyle	16	Adequate	
Ballito Manor Estate	10	Adequate	
Bogmore Park	14	Adequate	
Etete West	-	Adequate	
Extention 5	-	Adequate	
Fire Station	-	Good	Based on the comment within the 2019 master plan that this switch station has been refurbished.
Hewitt Road	-	Adequate	
Marion Road	-	Marginal	Several 11kV oil circuit breakers were rated in the repair/replacement category
Nkobongo	-	Good	Based on the comment within the 2019 master plan that this switch station has been refurbished.
Peter Hulett	22	Marginal	Several 11kV oil circuit breakers were rated in the repair/replacement category

Promenade	-	Adequate	
Seaward Estate	-	Adequate	
Thompsons Bay	19	Adequate	
Tiffany's centre	10	Good	
V. M. H.	11	Good	
Village	-	Adequate	
Woodmead	11	Good	
Zimbali 1	-	Adequate	
Zimbali 2	-	Adequate	

Based on the condition identified across switching stations it can be noted that many are aged and fall within the marginal to adequate rating, however still functional. These will require refurbishment and replacement of equipment within the medium term. Some switching stations are in good condition and have been refurbished or replaced in recent years.

4.1.3.2.3 11kV Reticulation Transformers

The 11kV reticulation transformers and mini substations were not assessed in detail during the 2019 master plan and Zutari has therefore utilised data captured in 2016 as part of the Asset Verification Project that was conducted. This data provides an indication of the condition per asset and is extensive based on asset numbers and has therefore been represented as percentages within a certain condition category. Figure 5 below illustrates the Northern mini-subs and transformers, and Figure 6 illustrates the Southern mini-subs and transformers.

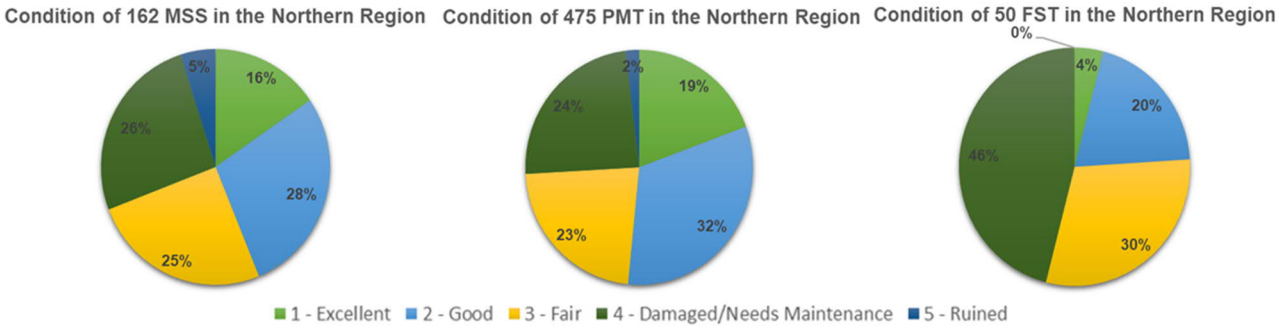


Figure 5: Northern mini-subs and transformers general condition

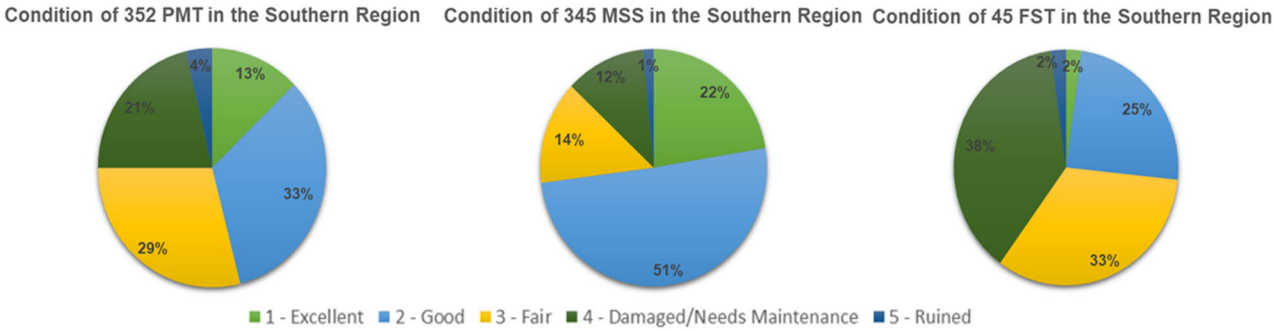


Figure 6: Southern mini-subs and transformers general condition

4.1.3.2.4 Single Line Diagrams & GIS Data

The available single line diagrams (SLD) for the municipal networks are extensive and cover the 33kV interconnection as well as the 11kV. These drawings were compiled initially in 2013 and where necessary some of the drawings have been updated between 2016 and 2018. The 33kV drawings illustrate a true reflection of the current network composition, the 11kV drawings however have not been updated in recent years and the extent of updates required cannot be quantified but is expected to relate to recent upgrade and expansion projects. From the review of the SLD provided the following were identified as updates required,

- Industrial substation third transformer and associated 11kV feeders
- Kwadukuza switching substation
- Groutville substation
- Business Park Transformer 4 and associated 11kV feeders
- Zimbali Transformer 3 and associated 11kV feeders

Figure 7 below is an extract from the Northern SLD. The detailed SLD for the 33kV and 11kV networks can be found under Annexure 1.

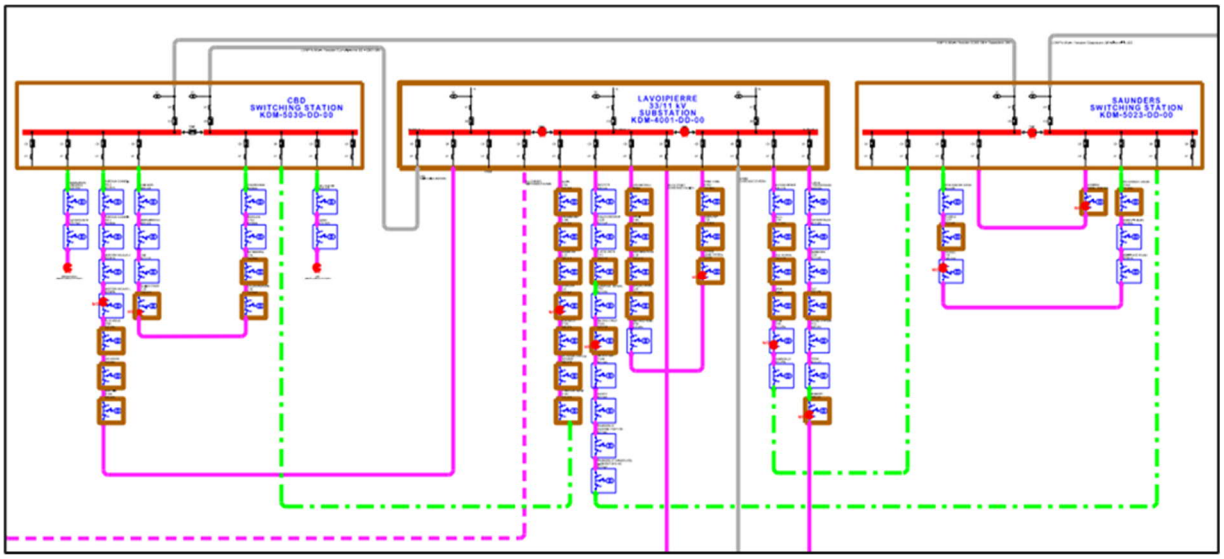


Figure 7: Single Line Diagram Extract

KDM has a GIS function that sits within itsDevelopment and Planning department. The GIS officer is responsible for all GIS related activities and this function is carried out using the ESRI GIS software for mapping and analytics.

The GIS data that is currently available was compiled during the previous master planning and Asset Verification projects and is around 5 years old. The data is however comprehensive and is a fair reflection of the greater extent of currently installed equipment and includes the following data,

- 33kV Substations
- 33kV Cables
- 33kV Overhead Lines
- 11kV Switch Stations
- 11kV Overhead lines
- 11kV Cables
- 11kV Distribution Devices that include mini-subs, pole and ground-mounted transformers.
- Registered Cadastral 2021
- Municipal Boundary
- Electrical Supply Boundary

Considering that this data set is now almost 5 years old, an update should be carried out to include key infrastructure recently installed such as substations, switching stations, 11kV feeders etc.

In addition to those highlighted above, there is additional information such as sewer and water which covers primarily bulk supply and is understood to be piece mill and not comprehensive. Additional useful GIS layers such as water pipes, land records, customer network links, routes, electricity meters, meter boxes etc. have not been developed to date.

Figure 8 below is an illustration of the extent of electrical infrastructure within the electrical GIS database.

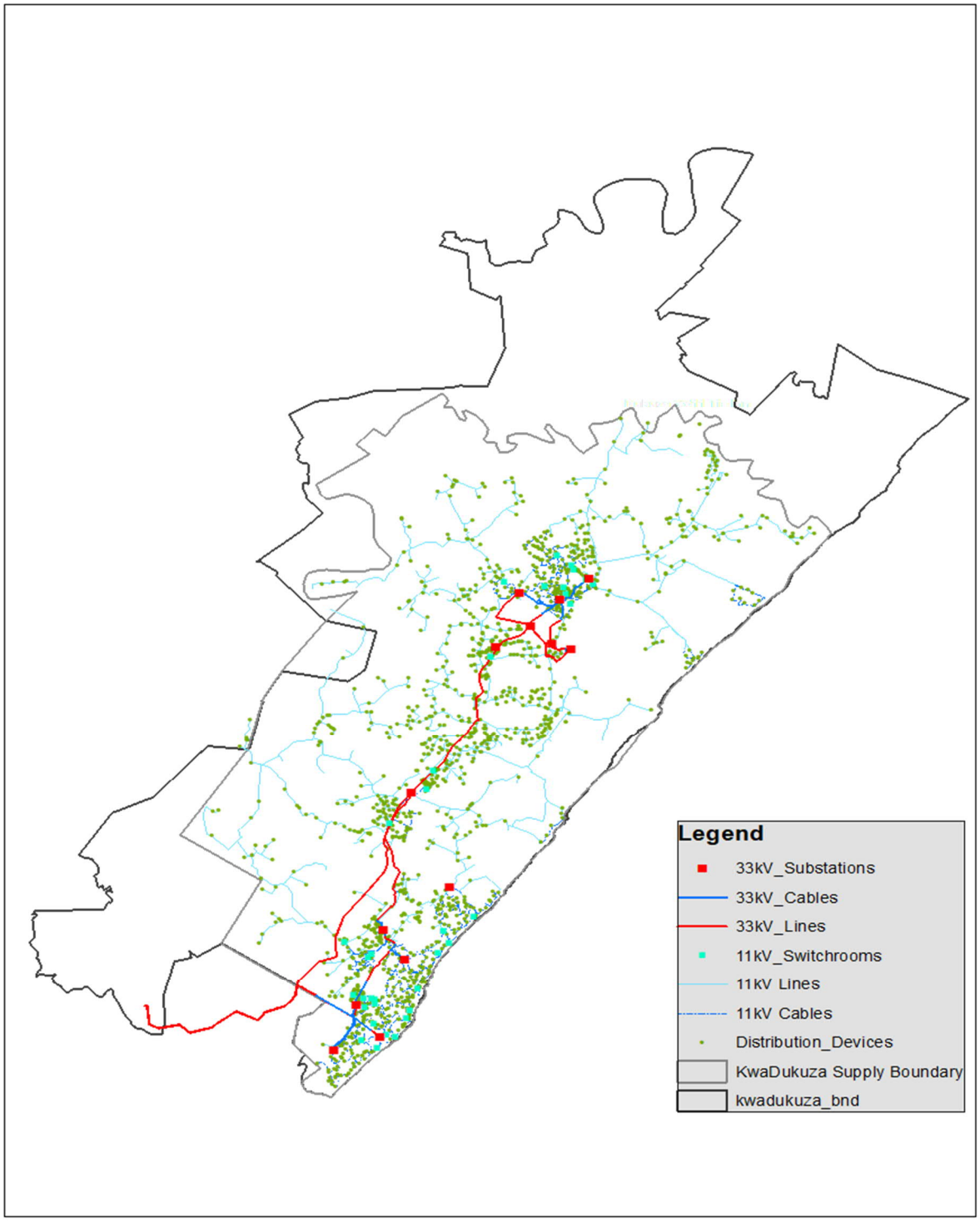


Figure 8: Extent of electrical infrastructure within the GIS database

4.1.3.2.5 Network Loading & Modelling

Table 11 below is an indication of the loading identified during the 2019 master plan revision. It is assumed that these values represent the network under its normal operating conditions.

Table 11: Substation loading identified during the 2019 master plan revision

Substation	Region	Contingency Capacity (n-1)	2019 Loading (MVA)
Ballito	South	20	13
Business Park	South	30	8
Chakasrock	South	10	10.8
Gledhow	North	0 (5MVA installed)	2
Glenhills	North	10	6
Groutville P1	North	10	7
Imbonini	South	10	11
Industrial	North	20	6
Lavoipierre	North	20	24
Sappi	North	30	15
Shakaskraal	South	20	14.5
Sheffield	South	10	6.4
Zimbali	South	10	2
Total			**125.7**

The loading on most substation transformers indicates that these substations are acceptable from a reliability perspective and provide n-1 redundancy capability. There are however some substations that do not have this capability such as Gledhow, Lavopierre, and Shakas Rock. The KwaDukuza network is interconnected allowing for the transfer of load between most substations to a certain extent. The Gledhow substation load can be transferred if required to Groutville substation via Melville switching station. The load at Lavopierre substation was over firm capacity in 2019 as it was supplying loads within the Industrial substation zone. Industrial substation has recently been expanded with an additional transformer thereby increasing capacity, and allowing load transfer from Lavopierre substation to Industrial substation.

A network model was compiled as part of the 2019 Master Plan revision. The model is a reduced version of the actual network and does not include reticulation transformers or loading at each MV reticulation point but rather lumped loading on the MV feeders. For the purpose of a planning study, this can be considered acceptable. Load flow studies were conducted on 11 kV feeders from the main transformation substations to switching stations and no cables except one feeder cable to Bilkus switch room were simulated in excess of 100% under contingency situations as per the 2019 Master Plan report. It can be noted that in terms of technical losses analysis, the model compiled for the EMP planning exercise does not provide the required detail to provide an accurate estimate of technical losses.

A second set of loading data has been provided for the year 2020 by KDM shown overleaf in Table 12 and 13. This loading data was manually captured independently for both the Northern and Southern regions at two different time periods within 2020. It must be noted that the loading provided are snapshots and does not necessarily reflect the substations peak loading. Table 12 and 13 overleaf represents 7 days of substation loading data for the Northern and Southern region respectively, these are extracts of data from the loading provided.

Table 12: KDM Load Readings July 2020 South

Substation	9 July MVA	10 July MVA	13 July MVA	15 July MVA	17 July MVA	21 July MVA	22 July MVA
Ballito	8.92	8.97	9.03	8.63	8.52	8.86	8.80
Business Park	5.37	5.60	5.72	5.49	5.43	5.72	5.66
Chakasrock	7.54	7.72	7.60	7.66	7.66	7.77	7.83
Imbonini	6.69	6.86	6.74	6.69	6.12	6.80	6.86
Shakaskraal	11.83	10.80	12.80	10.46	12.97	12.35	13.37
Sheffield	4.23	4.34	4.29	4.34	4.12	4.52	4.52
Zimbali	2.86	2.86	2.86	2.51	2.63	2.51	2.51
Total	**47.44**	**47.15**	**49.04**	**45.78**	**47.44**	**48.53**	**49.55**

Table 13: KDM Load Readings April/May 2020 North

Substation	21 April MVA	22 April MVA	25 April MVA	28 April MVA	30 April MVA	1 May MVA	2 May MVA
Gledhow	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Glenhills	6.29	5.89	5.54	6.34	6.63	6.34	5.32
Groutville P1	9.55	9.03	8.80	8.63	8.34	8.74	7.94
Industrial	9.49	9.26	8.00	9.03	9.83	9.20	8.29
Lavoipierre	9.55	8.86	9.72	9.89	8.29	7.94	8.86
Sappi	11.55	14.75	11.60	12.80	13.55	13.43	13.32
Total	**48.41**	**49.78**	**45.67**	**48.70**	**48.64**	**47.67**	**45.72**

The loading for the Southern network is lower than that identified during the master planning study. This is due to the period in which the data was captured, the Southern network has their peak in the holiday period December/January and this data was captured in July, therefore lower than the actual yearly peak. The Northern readings are also lower than that used in the master planning study, and this is due to the fact that the Northern regions peak in the winter months of June/July. The yearly maximum demand is typically between 52-68MVA for the Southern region and 58-65MVA for the Northern region based on Eskom billing. Therefore, to get these loads, the actual substation loading would be at least 30% higher than those indicated in Table 12 and Table 13.

4.1.3.3 General Assessment of Metering & Meter Reading for bulk purchases

From a bulk supply perspective, the utility has 3 electricity intake points from Eskom which are being metered by Eskom only. KDM has identified the need for check meters and has subsequently installed the first two check meters at Shakaskraal substation, the first metering data comparison will be done after 01 April 2022. Therefore, validation of ESKOM data at this time is not possible. Sole reliance is placed on the accuracy of what ESKOM provides.

Reference information received in this regard consisted of the ESKOM invoicing for the periods July 2018 to June 2019, July 2019 to June 2020, and July 2020 to June 2021. The documents are in PDF format and consist of an invoice per intake point per month as well as a consolidated invoice per month.

The invoice data has been consolidated by Zutari into an annual overview per intake point as well as a combined annual overview.

NERSA D forms for the three financial years were also obtained for an assessment of purchased vs sold electricity.

ESKOM INVOICING

The tables below provide a summary of the annual data per intake point per financial year, as well as a combined summary. Please refer to Annexure 2 for the detailed overview.

The tables below provide a summary of the annual data per intake point per financial year, as well as a combined summary. Please refer to Annexure 2 for the detailed overview.

FY 2018-2019

Intake Point	Stanger	Driefontein	Shakaskraal	Combined
Premise ID	5433388634	7032344358	8851805893	
	Annual			
Notified Max Demand	74,167	27,750	46,583	*49,500*
Utilized Capacity	74,166.67	31,650.47	46,583.33	*50,800.16*
CONSUMPTION DETAILS				
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH	39,151,963.82	10,991,400.00	18,909,990.41	69,053,354.23
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH	123,118,552.68	40,211,760.00	58,300,905.82	221,631,218.50
HIGH SEASON ENERGY CONSUMPTION STD kWh	35,171,565.80	11,640,600.00	20,461,435.51	67,273,601.31
LOW SEASON ENERGY CONSUMPTION STD kWh	106,023,399.06	41,508,900.00	57,126,243.73	204,658,542.79
HIGH SEASON ENERGY CONSUMPTION PEAK kWh	15,024,995.46	4,443,840.00	8,767,280.44	28,236,115.90
LOW SEASON ENERGY CONSUMPTION PEAK kWh		16,387,200.00	24,212,308.57	40,599,508.57
ENERGY CONSUMPTION ALL kWh	361,847,279.70	125,183,700.00	187,778,164.48	674,809,144.18
DEMAND CONSUMPTION - OFF PEAK	684,457.91	249,875.21	378,722.68	1,313,055.80
DEMAND CONSUMPTION - STD	691,077.92	297,393.61	393,879.51	1,382,351.04
DEMAND CONSUMPTION - PEAK	727,132.08	286,905.17	416,246.68	1,430,283.93
DEMAND READING - KW/KVA	727,717.47	297,676.01	418,062.99	1,443,456.47
REACTIVE ENERGY - OFF PEAK	63,362,567.52	11,310,180.00	22,937,671.08	97,610,418.60
REACTIVE ENERGY - STD	51,886,151.84	13,419,720.00	24,394,214.16	89,700,086.00
REACTIVE ENERGY - PEAK	20,181,593.08	4,903,060.00	9,444,948.02	34,529,601.10
EXCESS REACTIVE ENERGY	1,867,722.33	0.00	226,267.40	2,093,989.73
LOAD FACTOR	71.33	60.00	62.75	*64.69*
CHARGES DETAILS				
Administration Charge @ R147.34 per day for monthdays	R 43,508.00	R 43,508.00	R 43,508.00	R 130,524.00
TX Network Capacity Charge R9.54/kVA	R 6,861,900.00	R 2,928,301.10	R 4,309,890.00	R 14,100,091.10
Network Capacity Charge R18.90/kVA	R 13,608,100.00	R 5,807,227.47	R 8,547,110.00	R 27,962,437.47
Network Demand Charge R35.83 /kVA	R 21,096,529.46	R -	R -	R 21,096,529.46
Ancillary Service Charge @ R0.0047 /kWh	R 1,375,019.66	R 8,629,627.53	R 12,119,646.08	R 22,124,293.27
High Season Off Peak Energy Charge @ R0.6068 /kWh	R 19,219,699.13	R 475,698.06	R 713,557.02	R 20,408,954.21
Low Season Off Peak Energy Charge @ R0.5253 /kWh	R 52,325,384.60	R 5,395,678.26	R 9,282,914.09	R 67,003,976.95
High Season Peak Energy Charge @ R3.6885 / kWh	R 44,834,585.08	R 17,089,998.00	R 24,777,885.05	R 86,702,468.13
Low Season Peak Energy Charge @ R1.2034 / kWh	R 42,207,846.75	R 10,523,102.40	R 18,497,138.14	R 71,228,087.29
High Season Standard Energy Charge @ R1.1174 /kWh	R 31,795,095.66	R 27,810,963.00	R 38,274,583.48	R 97,880,642.14
Low Season Standard Energy Charge @ R0.8282 /kWh	R 71,035,677.33	R 13,260,418.56	R 26,161,563.52	R 110,457,659.41
Electrification and Rural Subsidy @ R0.0917 /kWh	R 26,849,068.18	R 15,952,939.20	R 23,570,681.84	R 66,372,689.21
High Season Reactive energy Charge @ R0.1656 /kvarh	R 250,274.75	R 9,288,630.54	R 13,933,139.77	R 23,472,045.06
Service Charge	R -	R -	R 30,319.91	R 30,319.91
Total Charges before VAT	R 331,502,688.60	R 117,206,092.12	R 180,261,936.92	R 628,940,397.71

FY 2019-2020

Intake Point	Stanger	Driefontein	Shakaskraal	Combined
Premise ID	5433388634	7032344358	8851805893	
	Annual			
Notified Max Demand	75,000	27,750	47,000	*49,917*
Utilized Capacity	75,000.00	33,738.64	47,000.00	*51,912.88*
CONSUMPTION DETAILS				
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH	39,161,752.32	11,848,800.00	16,035,533.46	67,046,085.78
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH	117,717,356.64	41,655,300.01	53,515,354.84	212,888,011.49
HIGH SEASON ENERGY CONSUMPTION STD kWh	37,296,011.18	13,722,180.00	18,269,839.08	69,288,030.26
LOW SEASON ENERGY CONSUMPTION STD kWh	102,288,187.44	41,643,180.00	51,673,405.12	195,604,772.56
HIGH SEASON ENERGY CONSUMPTION PEAK kWh	15,983,069.98	5,164,140.00	8,076,967.02	29,224,177.00
LOW SEASON ENERGY CONSUMPTION PEAK kWh	41,564,909.57	16,312,860.00	21,720,198.04	79,597,967.61
ENERGY CONSUMPTION ALL kWh	354,011,287.13	130,346,460.01	169,291,297.56	653,649,044.70
DEMAND CONSUMPTION - OFF PEAK	686,016.04	265,420.55	353,909.24	1,305,345.83
DEMAND CONSUMPTION - STD	703,093.31	295,772.97	386,526.22	1,385,392.50
DEMAND CONSUMPTION - PEAK	728,663.99	281,477.43	393,947.76	1,404,089.18
DEMAND READING - KW/KVA	734,931.46	298,024.09	401,510.90	1,434,466.45
REACTIVE ENERGY - OFF PEAK	57,075,294.70	11,396,480.00	22,343,455.80	90,815,230.50
REACTIVE ENERGY - STD	47,540,163.02	12,984,600.00	22,842,481.50	83,367,244.52
REACTIVE ENERGY - PEAK	18,489,346.07	4,684,860.00	8,840,576.33	32,014,782.40
EXCESS REACTIVE ENERGY	1,564,998.89	0.00	433,230.54	1,998,229.43
LOAD FACTOR	68.00	62.50	59.42	*63.31*
CHARGES DETAILS				
Administration Charge @ R147.34 per day for monthdays	R 50,445.78	R 50,445.78	R 50,445.78	R 151,337.34
TX Network Capacity Charge R9.54/kVA	R 8,028,000.00	R 3,611,383.49	R 5,030,880.00	R 16,670,263.49
Network Capacity Charge R18.90/kVA	R 15,912,000.00	R 7,157,988.80	R 9,971,520.00	R 33,041,508.80
Network Demand Charge R35.83 /kVA	R 24,634,902.54	R -	R -	R 24,634,902.54
Ancillary Service Charge @ R0.0047 /kWh	R 1,557,649.66	R 9,989,767.50	R 13,458,645.37	R 25,006,062.53
High Season Off Peak Energy Charge @ R0.6068 /kWh	R 22,228,210.44	R 573,524.42	R 744,881.71	R 23,546,616.57
Low Season Off Peak Energy Charge @ R0.5253 /kWh	R 57,846,308.74	R 6,725,378.88	R 9,101,769.10	R 73,673,456.72
High Season Peak Energy Charge @ R3.6885 / kWh	R 55,147,984.73	R 20,469,414.42	R 26,297,444.96	R 101,914,844.10
Low Season Peak Energy Charge @ R1.2034 / kWh	R 46,789,618.06	R 14,343,794.75	R 19,097,462.71	R 80,230,875.52
High Season Standard Energy Charge @ R1.1174 /kWh	R 38,985,521.34	R 32,260,971.55	R 40,031,387.63	R 111,277,880.52
Low Season Standard Energy Charge @ R0.8282 /kWh	R 79,242,660.02	R 17,818,348.66	R 27,868,766.94	R 124,929,775.61
Electrification and Rural Subsidy @ R0.0917 /kWh	R 30,374,168.42	R 18,363,386.50	R 24,450,428.01	R 73,187,982.94
High Season Reactive energy Charge @ R0.1656 /kvarh	R 242,418.19	R 11,183,726.27	R 14,525,193.37	R 25,951,337.83
Service Charge	R -	R -	R 67,107.48	R 67,107.48
Total Charges before VAT	R 381,039,887.93	R 142,548,131.02	R 190,695,933.06	R 714,216,844.51

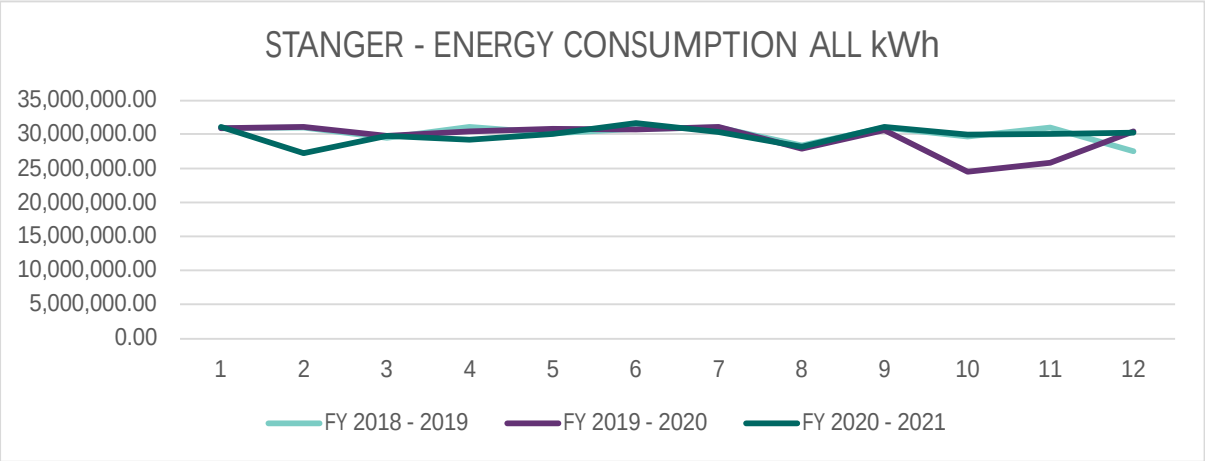
FY 2020-2021

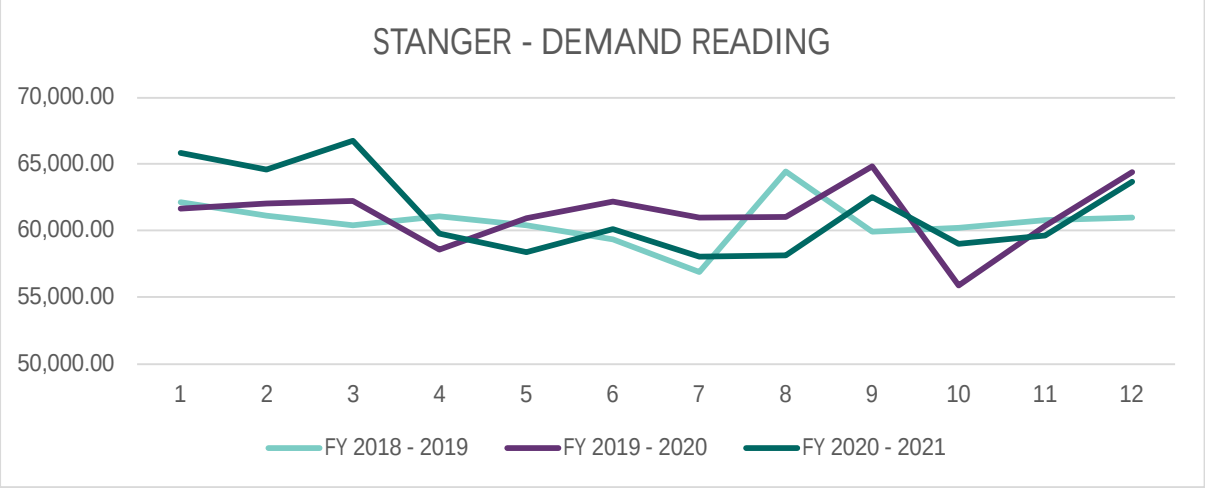
Intake Point	Stanger	Driefontein	Shakaskraal	Combined
Premise ID	5433388634	7032344358	8851805893	
	Annual			
Notified Max Demand	75,000	30,000	47,000	*50,667*
Utilized Capacity	75,000.00	31,828.38	47,000.00	*51,276.13*
CONSUMPTION DETAILS				
ENERGY CONSUMPTION OFF PEAK kWH	37,774,705.92	11,675,520.00	16,797,699.36	66,247,925.28
ENERGY CONSUMPTION STD kWh	35,578,123.92	12,614,400.00	18,331,577.73	66,524,101.65
ENERGY CONSUMPTION PEAK kWh	15,203,837.52	5,000,400.00	8,219,389.32	28,423,626.84
ENERGY CONSUMPTION ALL kWh	358,708,569.60	133,208,160.00	169,259,155.07	661,175,884.67
DEMAND CONSUMPTION - OFF PEAK	682,644.47	262,225.29	375,533.13	1,320,402.89
DEMAND CONSUMPTION - STD	710,187.57	301,553.20	375,412.78	1,387,153.55
DEMAND CONSUMPTION - PEAK	734,816.28	292,252.60	383,488.36	1,410,557.24
DEMAND READING - KW/KVA	736,404.21	303,044.67	389,666.75	1,429,115.63
REACTIVE ENERGY - OFF PEAK	52,435,869.12	16,612,820.00	21,606,606.72	90,655,295.84
REACTIVE ENERGY - STD	105,551,901.12	13,518,300.00	16,707,906.45	135,778,107.57
REACTIVE ENERGY - PEAK	31,399,066.40	4,972,500.00	6,457,832.29	42,829,398.69
EXCESS REACTIVE ENERGY	513,419.46	678.00	222,969.21	737,066.67
LOAD FACTOR	68.75	62.33	59.33	*63.47*
CHARGES DETAILS				
Administration Charge @ R147.34 per day for monthdays	R 53,779.10	R 53,779.10	R 53,779.10	R 161,337.30
TX Network Capacity Charge R9.54/kVA	R 8,586,000.00	R 3,643,712.85	R 5,380,560.00	R 17,610,272.85
Network Capacity Charge R18.90/kVA	R 17,010,000.00	R 7,218,676.40	R 10,659,600.00	R 34,888,276.40
Network Demand Charge R35.83 /kVA	R 26,385,362.84	R 10,858,090.53	R 13,961,759.65	R 51,205,213.02
Ancillary Service Charge @ R0.0047 /kWh	R 1,685,930.29	R 626,078.35	R 795,518.04	R 3,107,526.68
High Season Off Peak Energy Charge @ R0.6068 /kWh	R 22,921,691.60	R 7,084,705.54	R 10,192,844.36	R 40,199,241.50
Low Season Off Peak Energy Charge @ R0.5253 /kWh	R 63,423,286.88	R 22,488,093.00	R 28,759,159.60	R 114,670,539.48
High Season Peak Energy Charge @ R3.6885 / kWh	R 56,079,356.46	R 18,443,975.40	R 30,317,220.02	R 104,840,551.88
Low Season Peak Energy Charge @ R1.2034 / kWh	R 52,489,819.27	R 20,790,347.56	R 24,777,996.16	R 98,058,162.98
High Season Standard Energy Charge @ R1.1174 /kWh	R 39,754,995.76	R 14,095,330.56	R 20,483,704.14	R 74,334,030.46
Low Season Standard Energy Charge @ R0.8282 /kWh	R 87,620,829.06	R 36,301,248.30	R 41,884,087.64	R 165,806,165.00
Electrification and Rural Subsidy @ R0.0917 /kWh	R 32,893,576.05	R 12,215,188.27	R 15,521,064.70	R 60,629,829.02
High Season Reactive energy Charge @ R0.1656 /kvarh	R 85,022.35	R 112.28	R 36,923.67	R 122,058.30
Service Charge	R -	R -	R 1,683,996.85	R 1,683,996.85
Total Charges before VAT	R 408,989,649.68	R 153,819,338.12	R 204,508,213.92	R 765,633,204.86

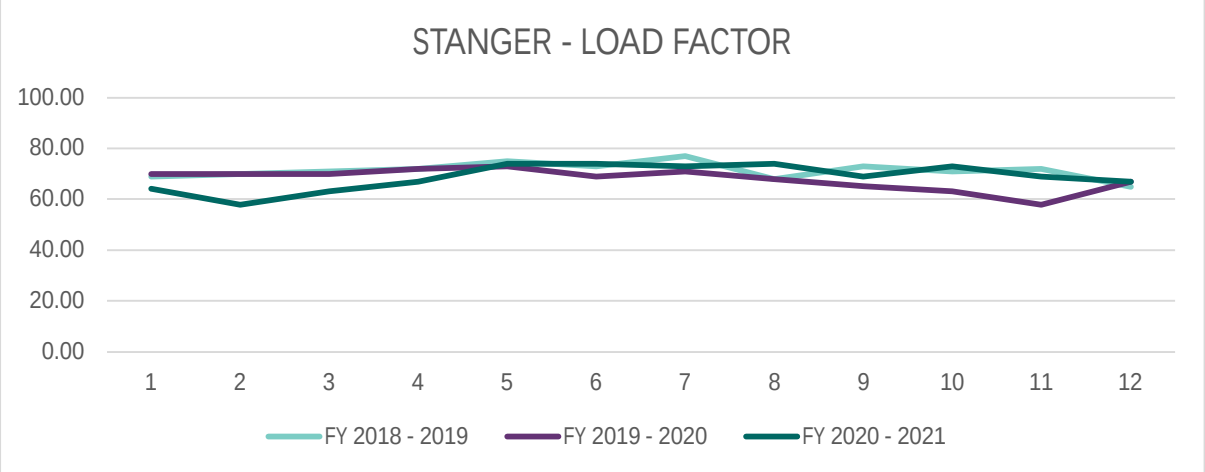
STANGER INTAKE POINT

The graphs below provide an overview of the Stanger intake point for the three financial years with respect to:

- Energy consumption per month per financial year.
- Demand reading per month per financial year.
- Load factor per month per financial year.



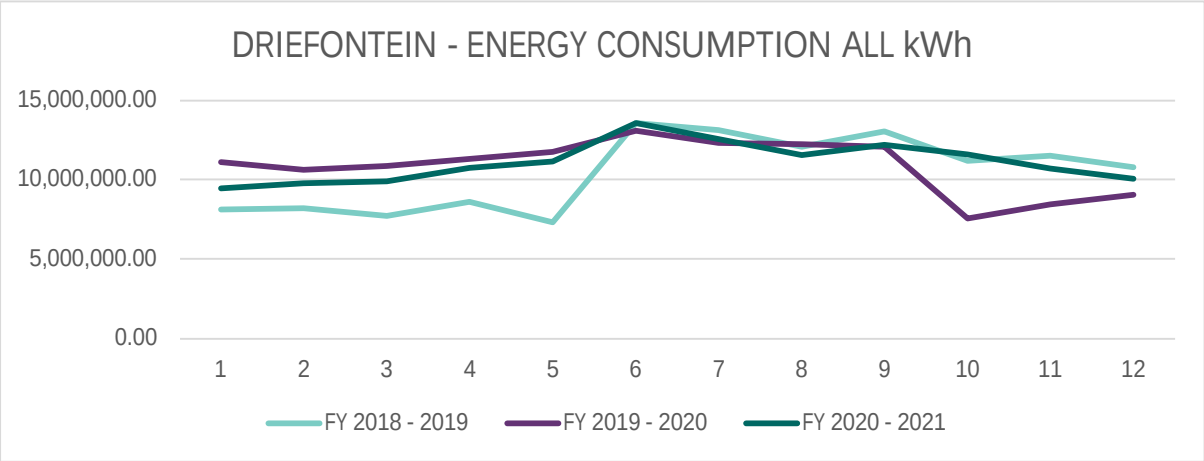


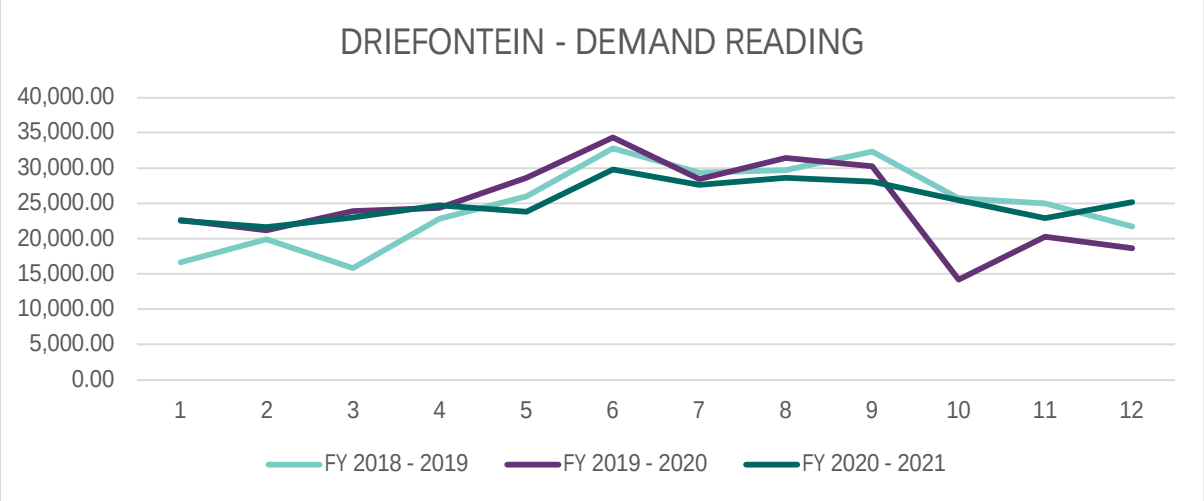


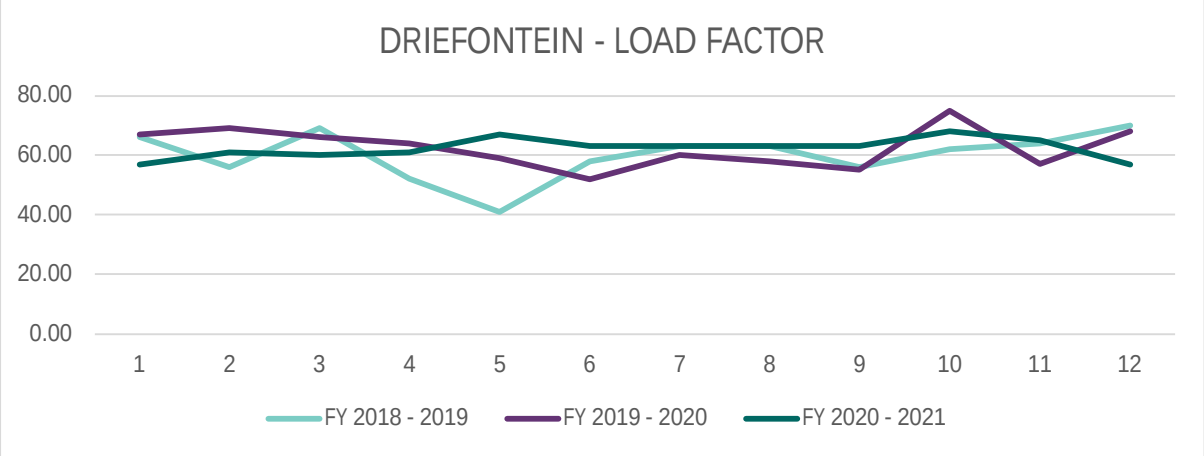
DRIEFONTEIN INTAKE POINT

The graphs below provide an overview of the Driefontein intake point for the three financial years with respect to:

- Energy consumption per month per financial year.
- Demand reading per month per financial year.
- Load factor per month per financial year.



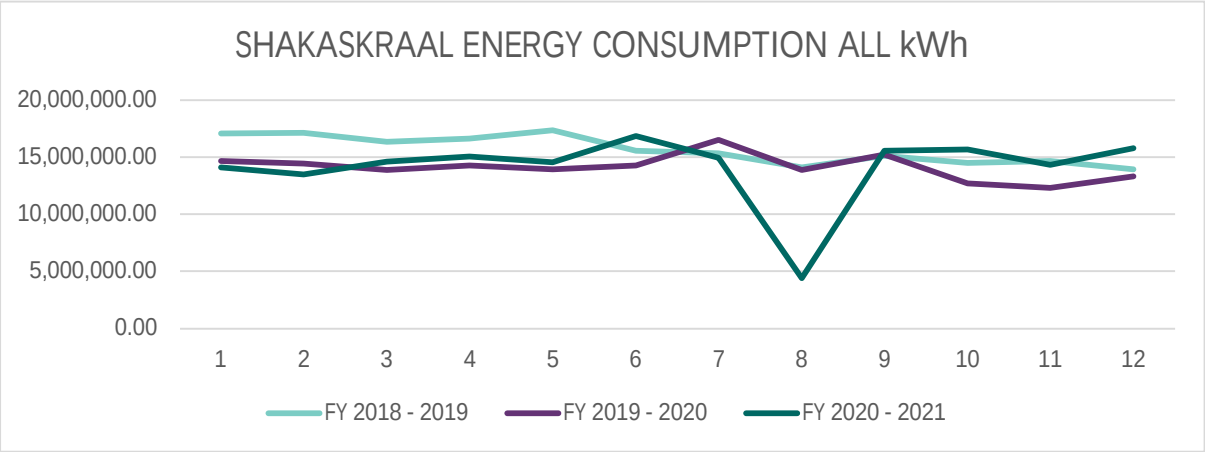


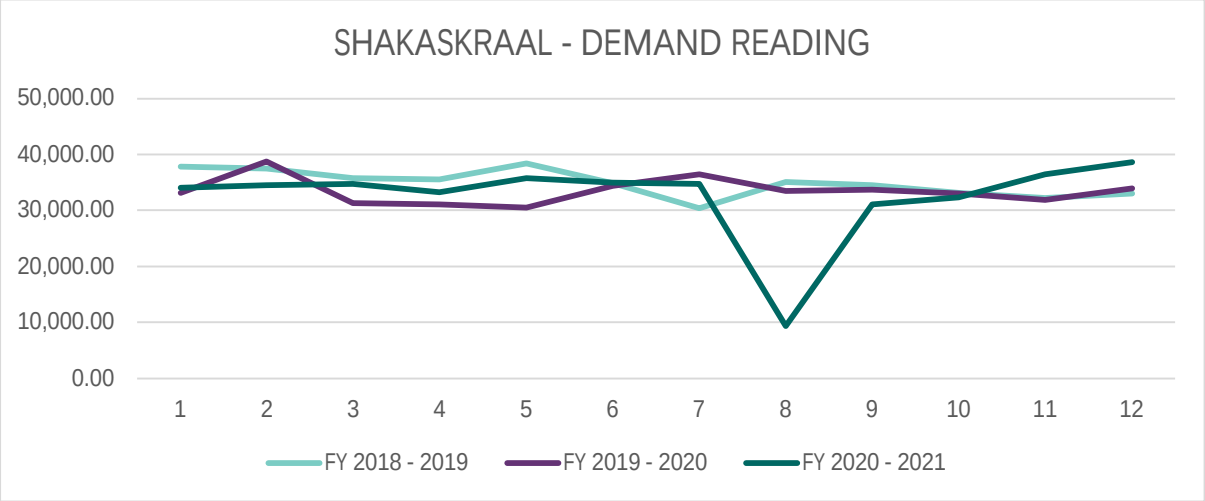


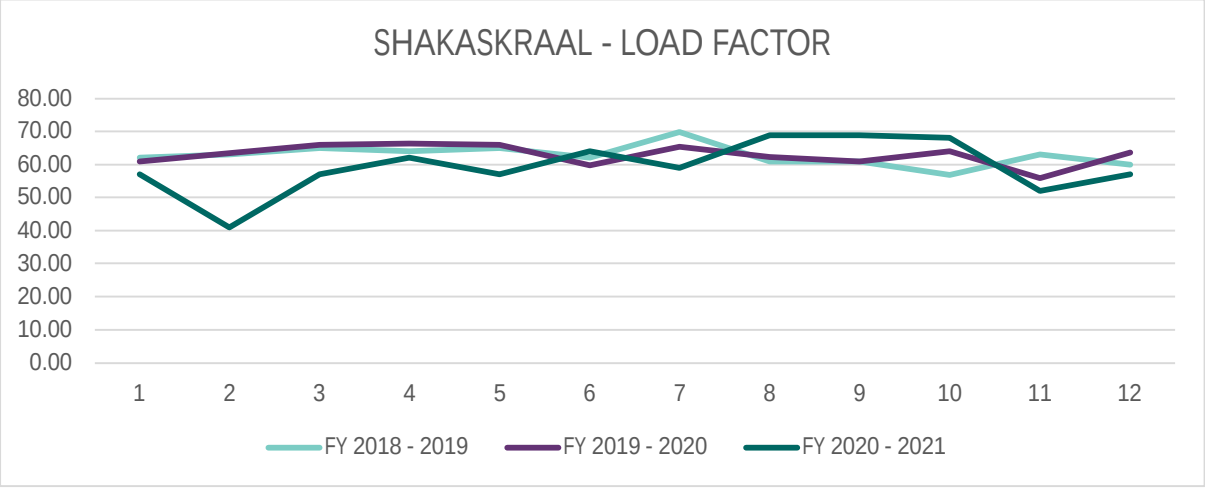
SHAKASKRAAL INTAKE POINT

The graphs below provide an overview of the Shakaskraal intake point for the three financial years with respect to:

- Energy consumption per month per financial year.
- Demand reading per month per financial year.
- Load factor per month per financial year.

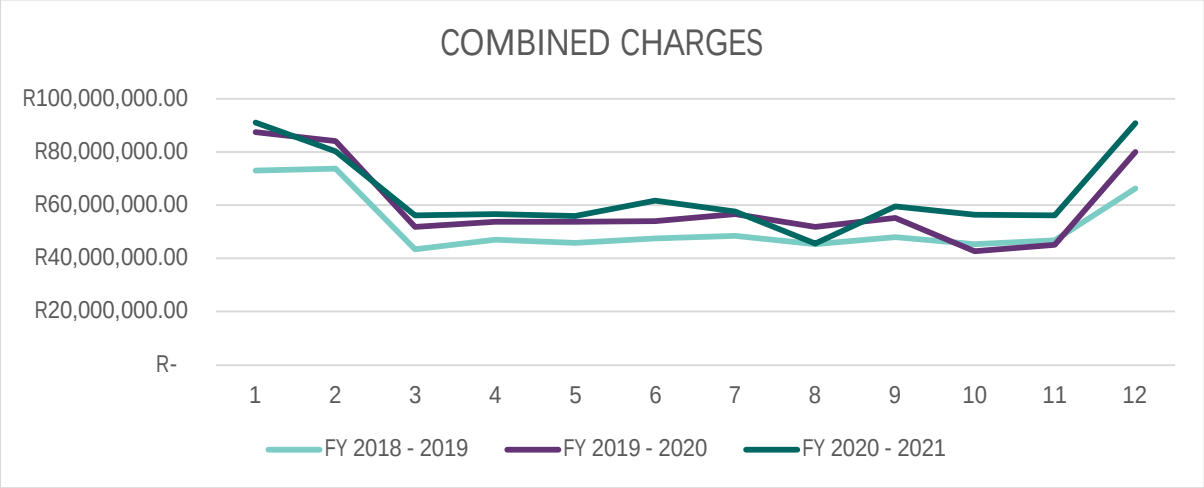






COMBINED CHARGES

The graph below depicts the combined charges for all three intake points per month per financial year.



Observations:

The following observations have been made from the assessment of the ESKOM invoicing data received:

- On average consumption charges amounts to 77% of total charges with ancillary charges making up the balance.
- Shakaskraal is the only intake point on which a monthly service charge is also levied based on the number of days in a month. This is on average an additional R 140 333 to the Shakaskraal invoice.
- Shakaskraal registered a huge drop in consumption in February 2021, resulting in charges for that month being approximately R 13m less than the average of just over R 18m of the other months. This discrepancy can only be attributed to a metering fault on the part of ESKOM. A single incident of this nature is not considered to be indicative of untrustworthy data from ESKOM.
- Interest charges for late payment were observed on the July 2020 invoice. This was however reversed the following month and no other charges of this nature were observed. This indicates that KDM pays ESKOM timeously every month.
- Charges are considerably higher for the high season months, July, August, and June, compared to the low season months.

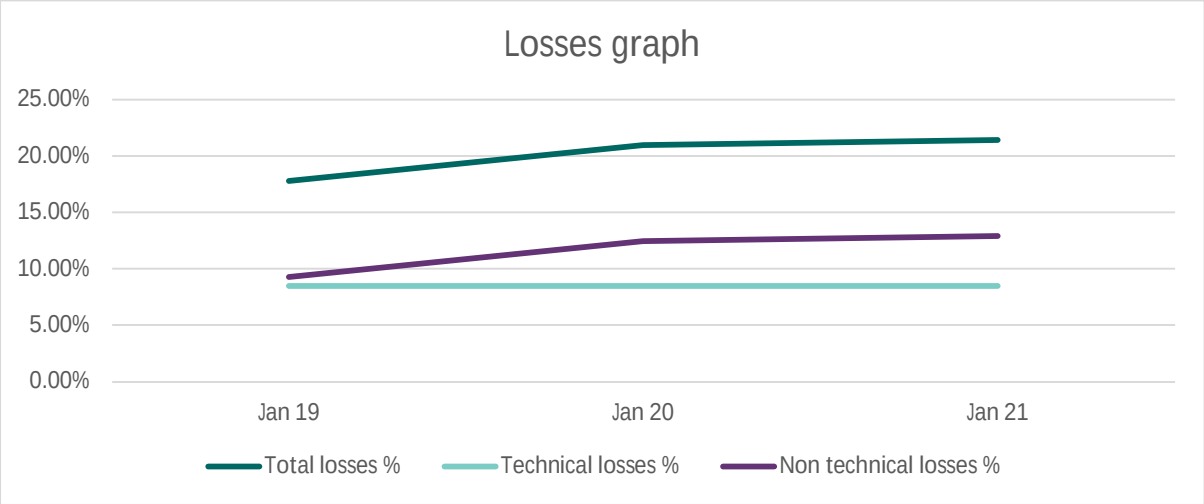
NERSA D FORMS

The NERSA D forms for the three financial years were analysed to obtain a picture of electricity purchased vs electricity (broken down per customer type) and the resultant total losses. The below table provides and overview of the analysis.

NERSA D FORMS SUMMARY	FINANCIAL YEAR ENDING		
	Jul-19	Jul-20	Jul-21
Energy Purchased in kWh	674,809,144	655,647,276	661,912,957

Energy Sold in kWh	Units	% of Energy bought	Units	% of Energy bought	Units	% of Energy bought
Free basic electricity	8,296,542	1.25%	7,203,742	1.09%	7,623,352	1.15%
Domestic (prepaid)	78,301,215	11.83%	77,923,591	11.77%	80,198,280	12.12%
Domestic (conventional)	124,323,584	18.78%	119,444,205	18.05%	127,231,550	19.22%
Commerial (prepaid)	17,729,029	2.68%	7,912,835	1.20%	8,199,487	1.24%
Commerial (conventional)	333,417,335	50.37%	311,321,719	47.03%	300,944,379	45.47%
Sales to other municipalities	982,001	0.15%	1,747,758	0.26%	3,393,340	0.51%
Total Sales	554,753,164	83.81%	518,350,108	78.31%	519,967,036	78.56%

Total losses in kWh	120,055,980	137,297,168	141,945,921
Total losses %	17.79%	20.94%	21.44%
Technical losses %	8.50%	8.50%	8.50%
Non technical losses %	9.29%	12.44%	12.94%



Observations:

The following observations have been made from the assessment of the NERSA D forms data:

- Total losses are showing a constant increase, and cause for concern. NERSA benchmark for total losses is 11 %. KDM is on its way to be double the standard.
- An average of 8.5% for technical losses have been used based on our assessment of section 2: Technical losses. The implication is that non-technical losses have been in the region of what **total** losses should be for FYE July 2020 and July 2021.
- The table below depicts the impact of possible additional review, should KDM be able to achieve the benchmark of 11% total losses.

NERSA benchmark 11 % total losses	74,229,006		72,121,200		72,810,425	
Additional sales	45,826,974		65,175,968		69,135,496	
Annual average selling price per unit	R	1.4225	R	1.6279	R	1.6826
Potential additional revenue at benchmark losses	R	65,188,870.74	R	106,099,957.72	R	116,327,385.12

4.1.3.4 General Assessment of Metering & Meter Reading for Large Power Users (LPU)

Reference information received in this regard, consists of:

- Excel list of High Use Customers
- Excel sheet of billing data for the period April 2021 to September 2021.
- Excel sheet of billing data for the period October 2021 to March 2022.
- Excel spreadsheets of Meter reading data per month for North, South, SAPPI and Time of Use Customers
- PDF document titled “Background on KDM energy stat”.

An analysis of the document titled “Background on KDM energy stat” showed that an assessment was done in 2020 to ascertain the extent of customers that need to be moved to smart metering systems as per Regulation 773 of the Energy Regulation Act. This act requires that all customers with monthly consumption of over 1000kWh have a smart meter installed.

The assessment conducted in 2020 has identified the following,

1. There were 13095 customers on the billing list.
2. 1892 were found to be consuming over 1000kWh over a period of 6 months and as per regulation 773 these should be Automatic Meter Reading (AMR).
3. 593 customers with maximum demand meters and modems installed for remote billing.
4. The balance of the information speaks to SPU customers (conventional and prepaid) and is thus not applicable to this section.

Based on the billing data for the year 2022, the utility currently has 489 High Use Customers in KwaDukuza. The list shows 493 however certain accounts are duplicated due to more than one meter linked to certain accounts. Out of the 489 bulk customers, there are 85 bulk meters with AMR within the Northern region which includes Sappi Stanger a high end-user, and 40 bulk meters with AMR within the Southern region.

To obtain a holistic view of metering and billing accuracy for LPU Customers, the various Excel documents were combined into one overview document. The process involved several processes of cross-referencing the various documents and took a considerable amount of time as many of the records had to be cross-referenced manually due to some differences in certain instances.

The account number for certain AMR customers differed in the AMR reading data and the billing data as an example. One such example is customer Equispark (Pty) Ltd with meter number 3514111229032. The account number in the billing data is 5141363 and in the AMR data it is 2022773. A possible explanation may be that a new debtor was created in the billing system, but the AMR data was not updated accordingly.

The same issue presents itself with AMR meter numbers in the billing data differing from the meter number in the AMR data. In some instances, it is just the first and last digit of the meter that is missing in the AMR data. There were a few isolated instances where the number differs completely.

To obtain a better understanding of how MUNSOFT works, Zutari also had a representative attend training at MUNSOFT’s head office to get an overview of especially the Customer Management module.

Observations:

From an analysis of the data, the following observations have been made:

- Various reports can be exported from the system, each serving its own purpose, as the above list of Excel reports indicate. To get to a holistic overview for data analysis purposes and addressing anomalies, this however seems to be a challenge.

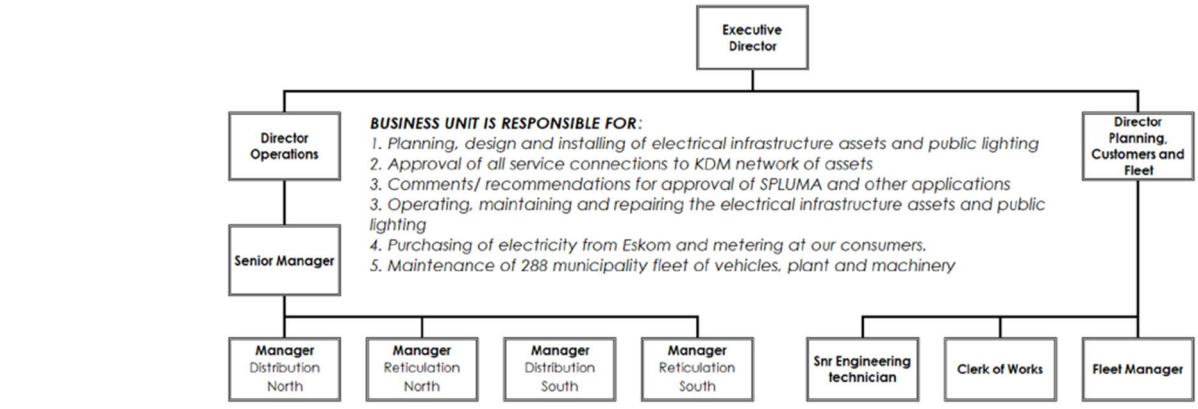
- Some LPU Customers have no account number reflected in the billing data. This was cross-referenced with the AMR data and accounts numbers could be obtained for all.
- Based on September billing data, 53 customers are being interim billed, indicating a problem with obtaining meter readings.
- Billing data suggest 44 Time of Use customers, however only 22 are listed on the TOU reading report received.
- Some disparity exists between the 2020 report and what our analysis has found.

4.1.3.5 Roles & Responsibilities

4.1.3.5.1 Provision of electrical services in general

Reference information received in this regard consists of the current and future planned organograms of the electricity department.

The organogram below reflects the current compilation of the electricity department:



		Filled	Vacant	Filled	Vacant	Filled	Vacant	Filled	Vacant	Filled	Vacant	Filled	Vacant	Filled	Vacant
1	Manager	1	0	0	1	1	0	1	0	0	0	0	0	1	0
2	Technicians/ superintendant	0	0	0	0	0	0	0	0	2	0	1	0	1	0
3	Artisans	6	2	5	1	6	2	5	1	0	0	0	0	3	0
4	Linesman/ senior supervisor	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5	Senior handyman/ streetlight attendant	0	0	0	2	0	0	1	1	0	0	0	0	0	0
6	Senior driver	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7	Artisan assistant/ handman	2	7	2	7	2	7	2	7	0	0	0	0	2	2
8	Control room attendant	6	2	0	0	0	0	0	0	0	0	0	0	0	0
9	Principal clerk	1	0	1	0	1	0	1	0	1	0	0	0	0	0
10	Senior clerk	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11	Messenger	0	0	0	0	0	0	0	0	1	0	0	0	0	0
12	Data capturer	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13	Tyre attendant	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14	General assiostant	6	6	7	6	6	6	6	7	0	0	0	0	4	1

Figure 9: KDM Electrical Organogram

Observations:

- The current department seems well structured, there is however a need to expand and fill vacant positions.
- A shortage of especially artisans and artisan assistants is noted.
- The are currently three key branches that have not been developed within the current structure and this is the Network Control & Support, Protection Telecontrol & Metering and Projects & Assets branch.

- Future plans have been noted regarding a Control Room branch for the SCADA system as well as a dedicated Protection Telecontrol and Metering branch responsible for meter repairs/replacements and protection of critical Electrical Network Protection equipment. The existing and proposed organogram is shown under Annexure 3.

4.1.3.5.2 Meter readings & billing

Reference information received in this regard consists of the current compilation of the billing and meter reading department as depicted below.

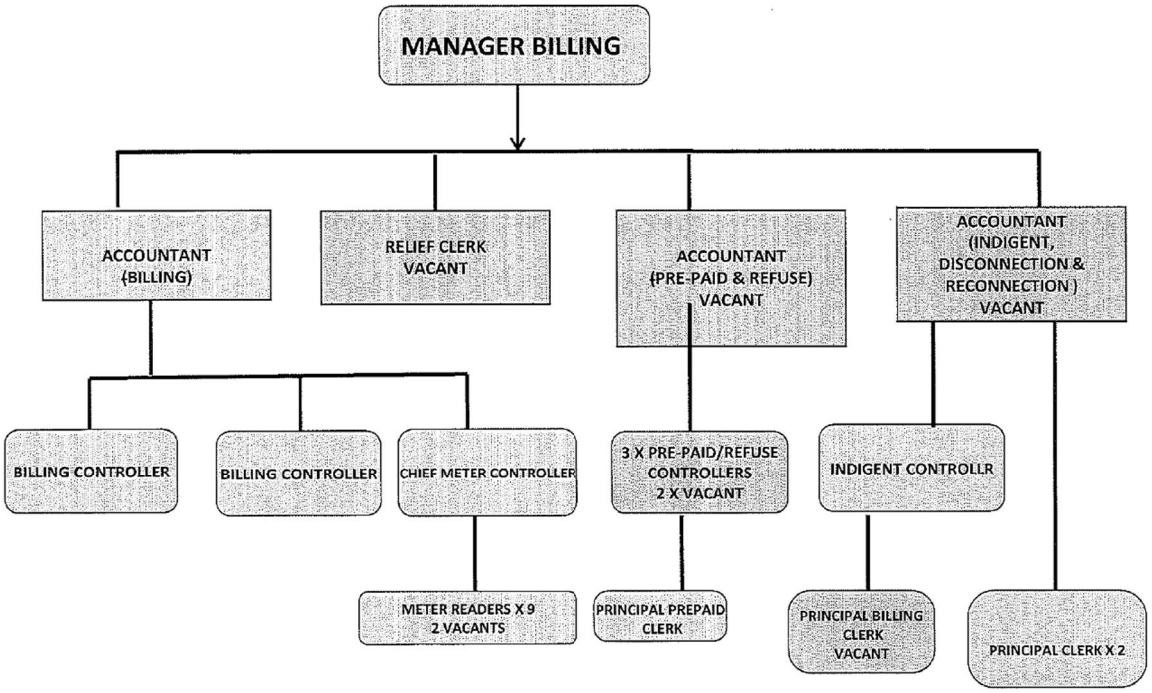


Figure 10: Billing Department Organogram

Observations:

- Several vacancies should be a cause for concern.

4.1.3.5.3 Revenue collection

Reference information received in this regard consists of the current compilation of the credit control department as depicted below.

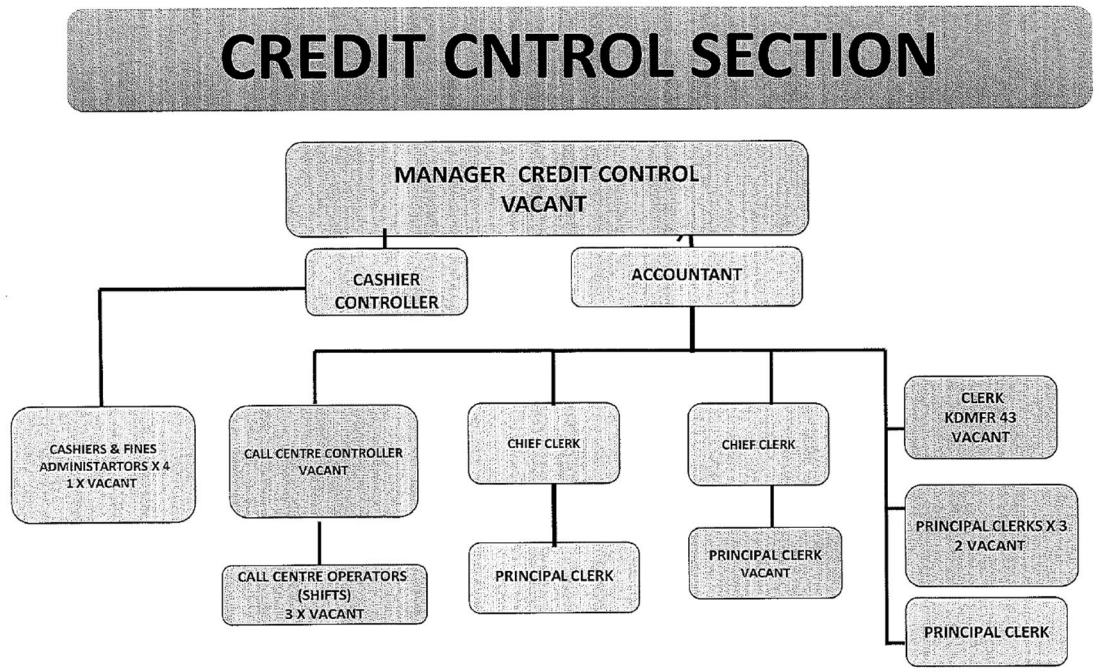


Figure 11: Credit Control Organogram

Observations:

- Several vacancies should be a cause for concern, most notably the position of Manager: Credit Control.
- The analysis of the debtor's book under 4.3.3.9 suggests this vacant position has a direct impact on challenges experienced with collections.

4.1.3.5.4 Operations & maintenance of electricity services infrastructure

The current structure does not have a dedicated breakdown of personnel for Operations and Maintenance. Operations and maintenance are done mainly by KDM teams, but portions of this work are contracted to private service providers. Maintenance is currently being done on assets but there is a backlog and general lack of preventative maintenance on critical infrastructure due to resource constraints. The current maintenance staff compliment is typically adequate for daily operational functions. The proposed organogram planned for 2023/2024 has identified a structure and associated resources required for maintenance and repairs. The proposed organograms can be found under Annexure 3.

4.1.3.6 Bylaws, Policies, Tarif Setting, Asset Management Planning, and Budgets for Maintenance

Reference information received in this regard, consists of:

- KDM Electricity Supply Bylaws
- KDM Asset Management, Tariff, and Indigent Policy
- KDM IDP 2021/22
- KDM Asset Management Plan
- KDM Draft Electricity Asset System Document

- KDM Energy Losses Reduction Action Items Progress Report
- KDM Tariff of Charges 2020/21 & Draft 2021/2022

4.1.3.6.1 Bylaws

KwaDukuza Municipality has a set of electricity supply bylaws prescribed for electrical supply within their licensed area. This bylaw has a comprehensive breakdown of the key aspects required for the provision of electricity services and conditions of supply. The bylaws provided indicate that these were last updated in 2010 and may therefore be out of date with a need for review and revision.

4.1.3.6.2 Policies

KwaDukuza has a range of policies in place that focus on specific goals and objectives, the extent of policies relevant to this exercise has been highlighted below.

Asset Management Policy: the objective of the policy is to ensure consistent asset management principles, implements accurate accounting, safeguards and controls the assets and complies with the MFMA and other related legislation.

Indigent Policy: the policy is to ensure that the Municipality is providing and regulate access to free basic services to all registered indigents. The indigent policy covers criteria for qualification, extend of support, arrears, non-compliance of households covered regarded as indigents, termination of support etc. To support this policy the utility has a standard operating procedure in place for indigent support. In addition to this, an independent report was compiled on the alignment of indigent policies across municipalities in the iLembe District. This report provides recommendations to improve the indigent registration systems.

Tariff Policy: the tariff policy prescribes the procedures and principles for calculating tariffs charged to the consumers. The policy is required in terms of Section 74 of the Local Government Municipal Systems Act, Act of 32 of 2000. The tariff policy covers the objectives, principles, categories of consumers, tariff types, tariff determination process etc.

Credit Control and Debt Collection: this policy provides credit and debt collection procedures and mechanisms to ensure that all consumers pay for the services that are supplied by the municipality. The credit control procedures cover application for services, applicable charges, subsidised services, payment options, etc. The debt collection procedures cover arrear on account, tampering and theft of service, debt arrangement etc.

4.1.3.6.3 Tariff Setting

The KwaDukuza municipality has an updated tariff policy for 2021/2022. The objective of this policy is to ensure the municipality's tariffs comply with legislations prevailing at the time of implementation, the Municipal services are financially sustainable, affordable, and equitable, and aligned to the principles of the Municipal System Act.

The tariff structure of KwaDukuza Municipality makes provision for different categories of customers such as,

- Domestic
- Commercial
- Industrial
- Agricultural
- Rural

- Municipal services
- Public sector
- Special agreements

The tariff policy acknowledges the need for free basic electricity, tariff affordability, and an indigent assistant scheme. The tariff determination process is reviewed during the preparation of the annual budget in accordance with the Tariff policy and the goal where possible is to provide a cost-reflective service charge. The KwaDukuza municipality currently has a final tariff of charges for the year 2020/2021 and a draft Tariff of charges for 2021/2022, these can be found under Annexure 4. The tariffs indicated overs the 2 past two financial years indicate a general increase across energy tariff and service charges. As per the tariff policy principles, Tariff must include the cost reasonably associated with rendering the service, including capital, operating, maintenance, administration, replacement and interest charges. The current methodology for tariff increases is expected to align with the current policy and principles however the methodology for the current Tariff setting is not documented.

A progress report compiled for EXCO on Energy Losses Reduction noted that according to municipal officials there may be a disparity between the bulk cost of electricity and the set tariffs which the municipality charge to their customers, leading to revenue losses. This statement alludes to the fact that there may be a need for a comprehensive tariff study.

4.1.3.6.4 Asset Management Planning

As part of the Vuthela LED project, IMQS established a high-level Asset Management Plan (AMP). This AMP is a high-level initial document to start steering the municipality towards implementing quality asset management planning. This AMP highlights key focus areas such as, current level of service, life cycle plan, financial plan, asset management practices, risk management plan and a performance plan. The AMP is expected to enable the development of a strategy to support the optimal, functional management of existing assets whilst considering the financial and technical decision-making aspects for future service requirements.

KDM is a category B municipality and is coming off a low asset management practice. There is relatively low asset management practice maturity, especially in the field of physical asset management within the utility. These poor asset management practices are often related to skill challenges and constrained budgets. Based on the AMP assessment there is currently a relatively low level of asset management practice maturity, especially in the “physical asset management” category, in line with many municipalities in SA.

The Electrical Engineering Services department has compiled a draft Electricity Asset Management System document that is a planned system to be implemented for electrical infrastructure. This plan is comprehensive and is aimed at demonstrating how its electrical network asset portfolio will meet the service delivery needs of its customers. This plan is expected to overcome the current status of 80% corrective maintenance and 20% preventative maintenance to 20% corrective maintenance and 80% preventative maintenance.

4.1.3.6.5 Budget for Operations & maintenance

KwaDukuza has been proactive in identifying its operations and maintenance needs as well as capital projects with support from the associated master planning assessments. KwaDukuza has an Operations and Maintenance plan for electricity in place which was tabled to council in March 2020 and was adopted and subsequently implemented as per the 2021/2022 IDP. The 2021/2024 financial year repairs and maintenance budgets are tabled below,

Table 14: Planned Repair and Maintenance Budgets

REPAIR AND MAINTENANCE VOTE	2021/22	2022/23	2023/24
Electricty - Rural North (Dept 430)	R 7 391 241,80	R 7 686 891,47	R 7 994 367,13
Electricty - Rural South (Dept 490)	R 3 949 000,20	R 4 106 960,21	R 4 271 238,62
Electricty - SAPPI (Dept 440)	R 1 845 371,40	R 1 919 186,26	R 1 995 953,71
Electricty - Urban North (Dept 450)	R 6 228 873,24	R 6 481 166,95	R 6 744 494,05
Electricty - Urban South (Dept 420)	R 5 725 693,84	R 5 954 721,59	R 6 192 910,46
Streetlights (Dept 171)	R 4 765 082,00	R 4 955 685,28	R 5 153 912,69
Grand Total	**R 29 905 262,48**	**R 31 104 611,76**	**R 32 352 876,65**

In addition to the above, the utility has identified network strengthening and expansion projects that will assist in catering to the expected load growth and increased reliability of supply. A list of the key capital projects currently underway is tabled below.

Table 15: Key Capital Projects Initiated

Project Name	Description	Project Budget	Comment
Dukuza Substation	Establishment of 160MVA 132/33/11kV substation	R 256 000 000,00	Contractor appointed, construction to commence. Funding from DTI and DMRE is required.
Sappi Substation Refurbishment	Refurbishment of Sappi 45MVA 33/11kV substation	R 58 000 000,00	Consultant appointed to do design and assist with DTI grant application.
Gizenga Substation	Establishment of 20MVA 33/11kV substation	R 45 000 000,00	Contractor appointed, and construction underway. Part funding from DMRE is required.

The KDM D forms were assessed over the past 3 financial years and the following expenses under the income statement were identified in Table 16 below over the past 3 financial years. The detailed breakdown of revenue, expenses, electricity purchases and sales etc. can be found under Annexure 5 Distribution Forms.

Table 16: KDM Expenses over three financial years

Description	Expenses 2019	Expenses 2020	Expenses 2021
Electricity Purchase Eskom	R 630 318 190,00	R 716 028 548,00	R 767 317 204,00
Repairs and Maintenance	R 15 352 312,00	R 26 995 957,00	R 28 812 873,00
Salaries, Wages & Allowances	R 44 203 793,00	R 52 292 138,00	R 48 831 696,00
Financial Costs (Interest)	R 14 730 420,00	R 14 193 474,00	R 13 056 582,00
Notified Maximum Demand Costs	R 170 612,00	R 0	R 0
Other Expenses (Bad debts,	R 10 021 748,00	R 10 835 445,00	R 1 680 469,00

FBE to Eskom)			
General Expenses (Depreciation, Collection Costs, audit fees etc.)	R 29 627 726,00	R 28 832 140,00	R 43 969 365,00
Total	**R 744 428 801,00**	**R 849 168 702,00**	**R 903 668 189,00**

It can be noted that when comparing the repairs and maintenance spend to revenue from sales of electricity, the repairs and maintenance spend falls within the 2% range of electricity sales in 2019 and 3% for 2020 and 2021. The financial cost in terms of interest has been relatively consistent over the last 3 years. The other expenses such as Free Basic Electricity (FBE) have decreased significantly from around R 10 mil to R 1 mil. The general expenses have increased in the last financial year and this can be attributed to the inclusion of audit and insurance costs under the expense category.

4.1.3.7 Technical Management Information Systems

Reference information received in this regard, consists of:

- KDM Systems Assessment and Improvement Pan
- KDM GIS Data
- KDM Asset Register
- KDM SCADA Functional Design Specification
- KDM Energy Losses Reduction Action Items Progress Report

The extent of information systems within the utility is documented at a high level within the Information Systems Assessment and Improvement Plan compiled for KwaDukuza in 2019. It can be noted that there is a general lack of information systems to support electricity service delivery, maintenance and asset management. The business unit has identified gaps in relation to service provision with one of these being electricity information management systems.

To enable the effective implementation of Master Plans, Maintenance Plans and projects leading to asset creation, the assets need to be properly managed and monitored. Various information system needs exist to support the utility, however very little is currently implemented. The current systems are largely manual and paper-based processes with a need for automated processes.

Figure 12 overleaf provides a breakdown of the current and proposed operational and database systems within KDM.

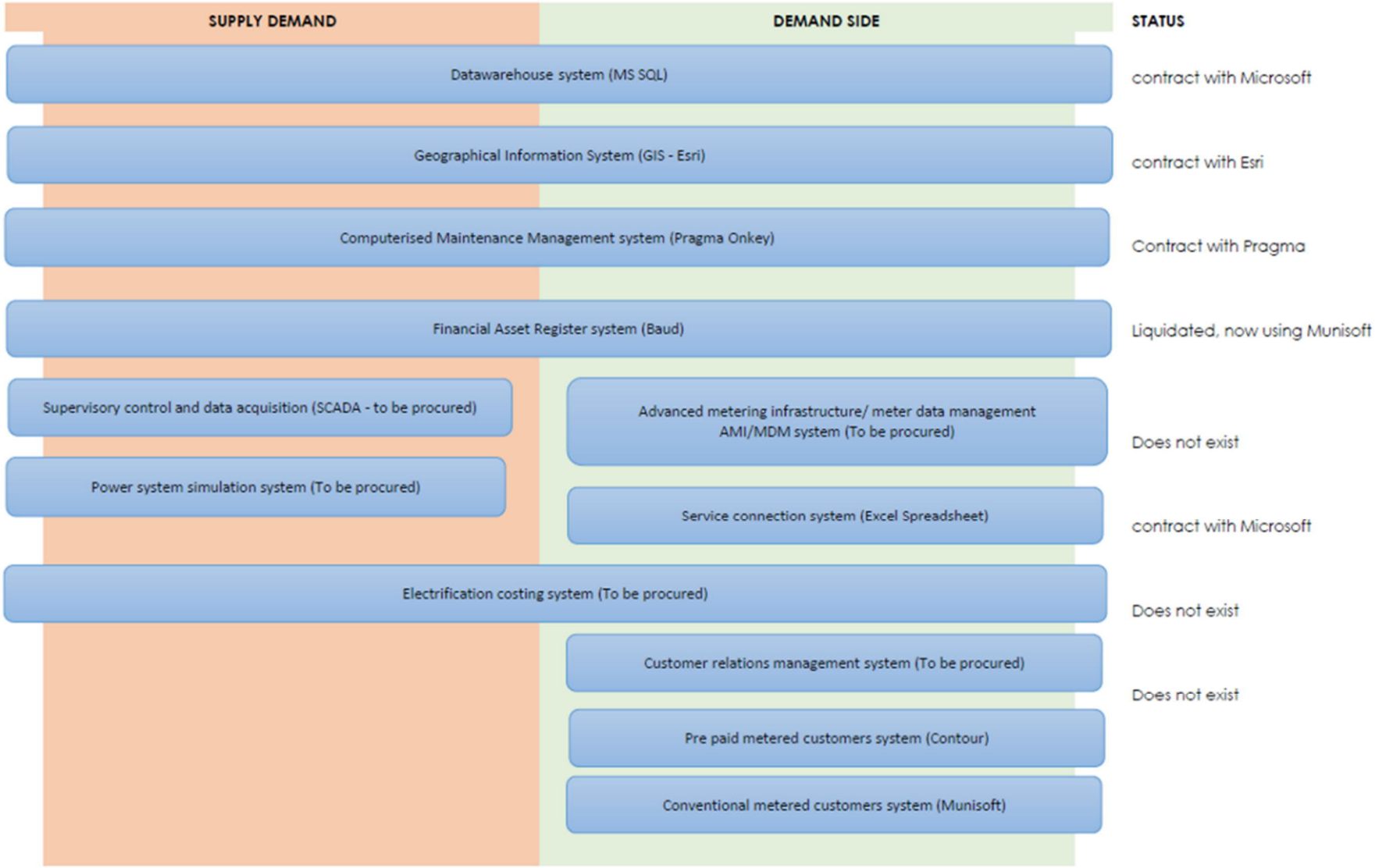


Figure 12: ***Operational & Database System***

The information systems that have been identified are discussed below,

Geographical Information System (GIS): GIS is a system used to display equipment, infrastructure, etc. at the correct geographical location relative to each other. KDM utilises the ESRI ArcGIS platform with ESRI South Africa as the service provider. The software is fully licensed with a maintenance plan and website interface. The GIS software currently does not have any interface with any other systems.

The bulk electrical infrastructure as shown in previous sections has been captured and available in GIS and excludes any LV electrical infrastructure. This data is however not updated regularly as there is no drawing office currently in place although there is a GIS officer within the planning and development department.

Financial Management and Billing: KwaDukuza utilise MUNSOFT version 8.3.16.25 which is an integrated financial management and internal control system which is mSCOA compliant. Payroll is excluded from this platform and conducted on an independent system called Sage VIP Premier. The service provider for Munsoft is Munsoft Pty (Ltd) and KDM has an associated service level agreement for maintenance and support. The Munsoft software is currently utilised by more than 30 users and currently has no interfaces to other systems. Please refer to section 4.3.3.3 in this regard for a more detailed assessment.

Asset Register: Baudnext was previously used for the movable and immovable asset register until the company liquidated. The asset register data has now been migrated to Munsoft software and is currently utilised within this platform. Munsoft provides an asset module that KDM utilise for asset capture and asset management for fixed assets. These fixed assets life cycle is monitored within this tool and includes depreciation adjustments, repairs performed, condition etc. and are updated with a physical verification every 3 years with sample verifications done on a yearly basis. The Munsoft Asset management tool currently has no interfaces to other software except the Munsoft financial system. This therefore allows for goods captured within the supply chain or procurement module to be classified as a fixed asset and moved to the asset register.

Asset Planning & Asset Creation: Typically done in Excel and then migrated to Munsoft Asset Management Tool.

Maintenance Management System (MMS): Maintenance management systems are used to manage the maintenance of electrical network infrastructure. KwaDukuza historically had software in place called ARAMIS intended for maintenance management, this was however never functional, and the utility looked at an alternate tool for this purpose. In 2015 KwaDukuza implemented a computerised maintenance management solution for electricity infrastructure. The project was implemented, however not fully successful as it is currently not being utilised fully. The software utilised is the On Key web-based Enterprise Asset Management System which is licensed with more than 10 users. The service provider for this software is Pragma and currently has no interfaces to other systems.

SCADA: System that monitors the infrastructure in real time for switching operations, outages, load conditions etc. As part of the Vuthela LED programme, a functional specification for the establishment of a SCADA system and control room to control and manage electrical services in the KwaDukuza Municipality was developed in 2019. The purpose of the functional specification was to ensure that the SCADA system is suitably designed to ensure safe, reliable operation and is simple to maintain. The SCADA system configuration and the related equipment necessary for the complete installation, was detailed in this design specification and technical data sheets. KwaDukuza subsequently appointed a consultant for the review, verification, compilation of tender document and construction project management. This project has gone out for tender and is currently in the adjudication phase of appointing a contractor to carry out the works.

The SCADA system will allow for remote monitoring of infrastructure, control of infrastructure and provide information on the electrical system in real time and through customised user reports. This

information, specifically statistical metering data is crucial in conducting technical losses assessments as it will provide the correct loading on the network, both in terms of maximum demand and the load profile of the various loads on the network. Phase 1 of the project will include all major Distribution substations, phase 2 will include 36 key switching substations and phase 3 will include a smart metering system where power flow through 244 x 11kV feeders and 1405 reticulation transformers will be metered.

The Asset Management Information Systems (AMIS): As part of the Vuthela Ilembe LED Programme, an AMIS scoping study was conducted for KDM. The study conducted provides an assessment of the current utility processes and gap analyses thereof. The output of this analysis identified opportunities that are exposed by the challenges experienced. Some of these opportunities are highlighted below,

- Develop a standard asset definition and structure
- Development of a technical asset register
- Centralise asset master data for both financial (FAR) and engineering (TAR) needs
- The use of an electronic maintenance scheduling system
- Implementation of a computerised Job carding system etc.

The proposed solution to address the challenges is addressed through an integrated asset life-cycle system. To achieve this all systems and subsystems used in the utility need to be fully integrated and supported by relevant business processes and controls. The general requirements for the AMIS and associated components have been unpacked as part of the AMIS study, with a solution roadmap on the proposed way forward. The solution is phased over a 3-year period with the key components highlighted below,

Year 1: Implementation and configuration of a maintenance management system

Year 2: Review of the asset register, implementation of the asset register system, integration with the finance and GIS systems

Year 3: Implementation of the specialist systems

Customer Relationship Management (CRM): KDM have a control which is manned 24/7. There is a three-shift system used where there are two employees at each shift. There are 6 employees which makes the coverage for the three-shift system to be inadequate, basically short by two staff to make a 40-hour week rotation. The control room has two functions,

- Attendance of consumer queries through the communication channels of telephone, WhatsApp, Facebook page, and walk-ins. The telephone system being utilized is a normal office telephone and not a call centre type telephone that has ability to queue calls, record calls and provide call reporting. Every time a call is logged a reference number is provided by utilizing the Onkey system (this is the computerised maintenance management software). The Pragma Onkey software is a web-based system where the database sits within the Pragma Cape Office server, which impacts the speed of the system as advised by KDM.
- Dispatching of field resources. The reference number generated by the Onkey system is used as a job card number. After hours work is handled by the standby staff, and they are notified through the control room.

Outage Management System: Outages are partially handled through the Onkey system by capturing power outages on the Onkey system. KDM have developed a proposed works management procedure that will be implemented with the new SCADA and Control Centre establishment.

4.2 Technical Losses

4.2.1 Overview

The ToR for this section read as follows

“A study was carried out by the World Bank Group to roughly estimate the technical energy losses of the urban 33kV&11kV network of KwaDukuza Municipality (hereinafter identified as KDM), by running power flows on a “virtual distribution system / network” which represents the situation in the field. The PSP is expected to familiarise themselves with this report and refer to it where necessary.

From the report, the service provider to deduce the Electricity Balance of the Municipality in terms of:

- The quantum of electricity loss

- The key elements in the grid where the electricity losses are occurring, and

- The reasons/cause of the loss

The consultant is expected to liaise with municipalities and the relevant stakeholders’ municipalities in line with the energy losses study for the purpose of advising strategic and pragmatic steps to intervention of NRE.”

4.2.2 Detailed Deliverable Breakdown

The table below provides a detailed breakdown of the 2 aspects assessed as per the ToR and the Reference information used in the assessments.

Table 17: Technical Loss Deliverable breakdown

Number	Assessment Item	Reference Material	Source	Received
2.1	Assess Worldbank Group Study on 33kv & 11 kv networks of KDM	Worldbank Group technical losses study (T)	WBG	Y
2.2	Determine energy balance ito: - Quantum of electricity loss - Key elements in grid where losses are occurring - Reasons / causes of losses	Worldbank Group technical losses study (T)	WBG	Y
		KDM distribution losses report 2018-2019 **(A)** (R)	Energy	Y
		KDM Energy Losses report 2020 **(A)** (R)	Energy	Y
		Network model used by Worldbank? (Z)	Energy	

4.2.3 Situational Analysis Findings

4.2.3.1 Technical Losses Analysis

Reference information received in this regard, consists of:

- KDM Electrical energy losses calculations and action plan report
- KDM EMP
- KDM Estimation of technical losses HV & MV Networks
- Distribution losses recon 2018/2019

The extent of technical losses studies compiled for the KwaDukuza electrical networks are limited to an internal estimate by the Electrical Engineering Services and two independent assessments,

1. KDM currently experiences technical losses in the distribution of electricity in the order of between 6 and 8 % as per the Electrical Engineering Services estimate. There are 2 methods for calculating losses and these are conducted monthly,

    1.1. The first method uses the following calculation,
    - Total Losses = Electrical energy purchased – (Energy sales Prepaid + Energy sales Conventional & AMR).
    - Technical losses = 10% of Total Losses and Non-Technical Losses = Total losses – Technical losses.

    The shortfall of this method is the estimate of the technical losses.

    1.2. The second method the methodology of NRS 080 and utilises loss factors for technical losses which depend on network classification per voltage level and customer type. KDM utilise the urban loss factor for voltage levels between 500V and 66000V. This method uses the following calculation,

    - Technical Losses = Energy Delivered *(Loss Factor – 1). The energy delivered is the Eskom metered usage at the 3 main intake points and the loss factor is 1.056 as per NRS 080.

    The shortfall of this method is that the required metering infrastructure across each feeder is currently not installed and secondly the associated customer numbers connected to these feeders are unknown as they are currently not linked.

2. As part of the 2019 Master Plan Revision, technical losses for the KDM electrical network were estimated using the following approach,
    - LV Copper losses were obtained directly from the Reticmaster simulation package designed to NRS 034
    - MV Copper losses were obtained by the DiGSILENT PowerFactory software package based on the networks produced for this study.
    - The magnetizing losses of the transformers were based on database no-load losses of similar transformers.

    The estimated technical losses for the Northern and Southern regions were estimated to be 6% and 8% respectively. The breakdown of percentage losses estimated from the analysis are tabled overleaf.

Table 18: EMP Technical Losses Estimate

Loss Type	North	South
LV Copper Losses	4%	5%
MV Copper Losses	0.5%	1%
Magnetizing Losses	1%	2%
Estimated Technical Losses	6%	8%

3. An estimation of the technical energy losses on the HV/MV networks of KDM were conducted in 2021 by a World Bank Consultant as part of the Vuthela Ilembe LED Support Programme. The following approach was taken to conduct the study,

    - Develop a virtual distribution network that represents the current Urban topology of the 33kV and 11kV system of KDM. This is a typical Eskom 33kV supply to a 33/11kV Distribution substation with three 10MVA transformers and associated 11kV feeders and 11/0.4kV reticulation transformers. The electrical equipment is based on information available within the EMP and parameters are derived from manufacture data sheets.
    - A power profile was developed using 2018/2019 energy consumption and maximum demand data for the purpose of estimating technical power and energy losses. The profile was broken down into three scenarios within a 24-hour day as tabled below,

Table 19: Loading Scenarios

Demand Type	Hours in day	Pmax (MW)	E (MWh/day)
Low Demand	7.4	6.1	45
Medium Demand	10.6	17.2	181
High Demand	6	25.6	154

    - Power flow studies were conducted on the virtual network for the maximum demand day as tabled above and related power loss across the network was calculated.

    The estimated technical losses from the virtual network study are equal to 4.92%, it must be noted that this does however exclude the LV network. This study has further concluded that this can be considered a worst-case scenario and 4.5% is a good reference for technical losses on the 33kV and 11kV networks. The breakdown of percentage losses estimated from the analysis are tabled below.

Table 20: Virtual Network Technical Losses Estimate

Load Profile			Energy Loss				
Demand Type	h	MWh/day	**Total**	33kV Line	33/11kV Tx	11kV Network	11/0.4 Tx
Low Demand	7.4	45	4.25%	0.48%	1.57%	0.26%	1.94%
Medium Demand	10.6	181	4.36%	1.45%	1.13%	0.75%	1.03%
High Demand	6	154	5.77%	2.25%	1.34%	1.13%	1.05%
Total	24	380	**4.92%**	**1.66%**	**1.27%**	**0.85%**	**1.14%**

Based on the analysis conducted to date it can be noted that the estimate of losses varies based on the different approaches taken. The utility calculations are indicative at best and provide a high-level indication of potential losses.

The independent analysis conducted follows different methodology with one taking a pragmatic approach utilising a combination of network modelling and typical equipment losses to estimate both the MV and LV network technical losses.

The other analysis utilises a typical sample network of the utilities Distribution system with accompanying metering data at the supply point to best estimate the 33kV – 11kV Distribution losses. In this study the LV network losses were not calculated.

A comparison of the two studies indicates that the sample "virtual network" has higher technical losses in the range of 1.5%, with the EMP study indicating a 3% loss and the sample network analysis concluding the technical loss estimation at 4.5% on the MV Distribution networks. The estimate of LV losses is in the range of 4% which is considered a fair estimate when compared to similar utilities. This total technical loss estimate is therefore 8.5% based on the analysis conducted to date.

KDM conducted a Distribution losses recon for the 2018/2019 financial year indicating an 18.05% total loss for both technical and non-technical losses. This equates to 122,149,967kWh at a cost of R115,101,490. With technical losses estimated to be 8.5%, this indicates a typical loss of R54,202, 917 per year.

4.2.3.2 Reasons for Technical Losses

Energy losses are defined as the difference between energy received by the utility, and the actual energy billed to end customers and is given by the sum of technical and non-technical losses.

Technical losses are those losses experienced in an electrical system that is due to the loading and electrical characteristic of the electrical network (for instance the network and transformer impedance and no-load losses of transformers)

The technical losses can be classified into two categories,

Fixed Losses: These losses remain constant despite the amount of power flowing in the system. This can typically only be reduced by replacing older assets with higher efficiency.

Variable Losses: These losses change based on power flow in the network, a highly loaded network will result in losses much higher than fixed losses.

The main reasons for technical losses are typically related to the following factors,

- Long Distribution lines
- Overloading of Distribution lines
- Inadequate size of Distribution conductors
- Distribution transformers located far from load centres
- Poor power factor on the network
- Poor network optimisation
- Imbalance on 3 phase feeders etc.

Accurate technical loss estimation can only be determined through network analysis of a complete network model. To date this has been considered not practical as the extent of information required was not available and the effort required to construct such a model is extensive. The study that has been conducted is based on network segmentation which utilises a sample of networks and provides a reasonable range that the level of losses that would fall in. The preferred would be the ideal method that is used on a comprehensive network model that would provide a higher level of accuracy. This method would however require statistical metering data across the network which is unfortunately not available for the KDM electrical network. Therefore, understanding the reasons and areas of loss in the network is currently challenging and requires further analysis. The KDM Electricity department

and previous analysis have not identified any specific sections of the network that are linked to excessive technical losses to zone in on.

4.2.3.3 Technical Losses Interventions

KDM have identified the following list of activities to support the reduction of technical losses in the network,

- Appoint service provider
- Model and analyse electrical energy flow
- Determine technical energy losses per feeder
- List energy consuming loads
- Install statistical meters
- Energy consumption analysis for 6 months

To date none of these have been complete, however statistical metering is currently being addressed at substation level as part of the SCADA project which is at the tender stage. The availability of this metering data will provide the basis for the first iteration of more detail analysis. The associated budget required to procure the power system simulation package for the calculation of technical losses has been allocated under a capital vote.

4.3 Non-Technical Losses

4.3.1 Overview

This section is the largest section of the project and is also expected to be the area where the biggest part of losses can be ascribed to. Refer to section 4.1.3.3 where non-technical losses have been between 9% (FY 2018-2019) and almost 13% (FY 2020-2021). The trend also indicates that non-technical losses are constantly climbing.

The ToR for this section read as follows:

"In line with the non-technical losses, the consultant will be required to execute the following tasks to investigate the possible areas of revenue loss, inter alia:

I. Assess the completeness and adequacy of metering of electricity use in each Municipality vis-à-vis the various categories of users,

II. Assess the adequacy, effectiveness, and efficiency of the institutional arrangements regarding meter installations and meter readings for bulk and reticulation supplies. Review of the Standard Operating Procedures and providing recommendations/comments for improvement.

III. Assess the adequacy, effectiveness, and efficiency of the financial management systems of the municipalities with regard to metering and billing (prepaid and conventional meters), historical payment levels, collections, cost recovery, implementation of credit control policies, ring-fencing of electricity accounts, free basic electricity, credit control and debtor management, revenue enhancement, customer account management, etc.

IV. Assess the integrity, completeness, and accuracy of each municipality's electricity customer database in the municipal financial system vis-à-vis its existing spatial development, actual number of end users, etc. Information from the Data Cleansing Project carried out under the Vuthela Programme's Public Finance Management Component (PFM) will be made available to the PSP as the bulk of the work was already completed. This must include:

- A reconciliation of households (customers) in the valuation roll to the Deeds Office and Surveyor General's listing.

- Assessment of the completeness of the customer information on the Municipality's billing system.

V. A report on the current customer/consumer relations management and/or information systems in place to log or record customer queries, track the resolution of the query, report on customer queries was produced under the PFM Component and the PSP is expected to familiarise themselves with this report on the incorporation of customer service into performance management of officials and the Electrical Department.

VI. Assessment of Billing and Revenue Collection in respect of electricity services provision: This must include an assessment of:

- Accuracy of billing

- Billed revenue versus collected revenue.

- Returned mailed billings.

- Return to Drawer Cheque Register

- Unallocated receipts

- Clearing of suspense accounts.

- Updating of debtor's ledgers

VII. The consultant will also be required to investigate the necessity for a tariff study and review to ensure that the tariff accurately reflect the costs of providing the electricity services in KDM.

VIII. The PSP is also expected to familiarise themselves with the Completed PFM Indigent Register Study to gain insight into the Indigent Management on the provision of electricity services, with respect to:

- Community awareness (or lack thereof)

- Formal indigent applications and verifications thereof

- Assessment of completeness (up-to-date status) of the municipalities' indigent register.

IX. Debt Management:

- Monthly review of debtors age analysis

- Percentage of debt outstanding for more than 90 days.

- Review of credit control measures.

- Follow-up of existing payment arrangements in place.

- Councillor involvement in Debt Management"

4.3.2 Detailed Deliverable Breakdown

The table below provides a detailed breakdown of the 8 aspects assessed as per the ToR and the Reference information consider as useful for the assessments.

Aspect VII was sub-divided into a) Tariff study necessity review and b) Indigent customers.

Table 21: Non-Technical Losses Deliverable Breakdown

Main Deliverable	Number	Assessment Item	Reference Material	Source
3. Non-technical Losses	**3.1**	Assess completeness & adequacy of metering of electricity - various categories of users	Customer data base from financial system (Z)	Finance
			Including billing data base and metering data base (Z)	Finance
			Spatial component (Z)	Finance
			Rezoning approvals over past 5 years (Z)	Finance
	3.2	Assess adequacy, efficiency of institutional arrangements for meter installations & readings (SOP)	SOPB003 - Meter Movement (A)	Finance
			SOPB006 - Meter Reading (A)	Finance
			SOPB004 - Prepaid (A)	Finance
			SOP for new connections (Z)	Finance
			SOP for connection upgrade (Z)	Finance
			SOP for connection removal (Z)	Finance
			Applicable policies (Z)	Finance
	3.3	Assess adequacy, effectiveness of financial	Customer Data base from financial system (Z)	Finance

		systems wrt: - Metering & billing (PP & Conv) - Historical payment levels - Collections - Cost recovery - Implementation of credit control policies - Ring-fencing of electricity accounts - Free basic electrcity - Credit control & debtor management - Revenue enhancement - Customer account management	PFM data cleansing project report (T)	Vuthela
			12 m Meter reading history (Z)	Finance
			12 m Billing data (Z)	Finance
			12 m PP purchase history (Z)	Finance
			PP Vending locations and transactions per location (Z)	Finance
			SOP Prepaid metering (A)	Finance
			SOP PP vending system (A)	Finance
			Meter reading error report (Z)	Finance
			Interim billing report (12 m data) (Z)	Finance
			Unmetered Municipal owned sites & methodology for estimation (Z)	Finance
			Payment levels history (Z)	Finance
			Revenue vs collections data (Z)	Finance
			Credit control policy & Procedure (Z)	Finance
			Arrears arrangements procedure (Z)	Finance
			SOPB001- Disconnection non-payment (A)	Finance
			KDM Revenue enhancement program 09-2020 (A)	Any
			SSEG Data (locations / meter installations / tariffs applied / sizing / impact on energy balance (Z)	Any
	3.4	Assess integrity, completeness & accuracy of energy customer data base wrt: - Existing spatial development - Actual number of end users - Reconcile customers in valuation roll to Deeds office & SG listing - Assess completeness of info on billing system	Customer data base from fin system (Z)	Finance
			Valuation roll (T)	Finance
			Customer Data Management System Report (A)	Any
			Cadastral data (T)	Finance
	3.5	Review report on Customer Relations Management System and / or Information Systems	PFM report on CRM / IS for query logging (T)	Vuthela
			Customer Care centre Strategic plan report (A)	Vuthela
			Current process / system for query logging (Z)	Any
			Any SLA between Energy & Finance for meter maintenance. (Z)	Any
			Dispute resolution process? (Z)	Any
	3.6	Assess billing & revenue collection re electrical services provision:	Customer data base with reading and billing history (Z	Finance
			Billed revenue vs collected	Finance

		- Accuracy of billing - Billed revenue vs collected revenue - Returned mail billings - Rd cheque register - Unallocated receipts - Clearing of suspense accounts - Updating debtor's ledgers	revenue report (Z)	
			Returned mail billings? (Z)	Finance
			RD cheque register (Z)	Finance
			Unallocated receipts report (Z)	Finance
			Unallocated receipts procedure (Z)	Finance
			SOP's related to revenue management / protection (Z)	Finance
	3.7.A	Investigate necessity of tariff study & review	Tariff policy (inc bulk contribution charges) (Z)	Any
			Energy tariffs 2020/21 (A)	Any
	3.7.B	Review completed Indigent register study wrt: - Community awareness - Formal indigent applications & verification thereof - Assessment of completeness (up-to-date) status of indigent register - Billing of indigents - Restriction of services to Indigents - Accuracy of offsetting of indigents against equitable share	PFM Indigent register study (T)	Vuthela
			Customer data base (indigents status) / Indigent register (Z)	Finance
			Indigent policy (Z)	Finance
	3.8	Debt management: - Monthly review of debtor's age analysis - Percentage debt outstanding > 90 days - Review credit control measures - Follow up of existing payment arrangements in place - Councillor involvement in debtor management	Debtor age analysis report (T	Finance
			Credit control policy & procedures (Z)	Finance
			Payment arrangements process (Z)	Finance
			Communication & stakeholder engagement policy (Z)	Any
			Debt management policy (incl incentives to settle quicker) (Z)	Finance
			Debt payment data base (if separate from bill payment data) (Z)	Finance

4.3.3 Situational Analysis Findings

4.3.3.1 Assess completeness & adequacy of metering of electricity - various categories of users

To make a proper assessment of this aspect, a full data set of the customer data base was requested that should as a minimum cover the following aspects:

- Account number
- 21 Digit SG land parcel code
- Address
- Meter number
- Meter type (Conventional / Prepaid etc)
- Tariff code
- Zone code
- Land use code
- Date of meter installation.
- Debtor information
- Meter status (Active / inactive)
- Stand status (active / inactive)
- Connection Size (Circuit breaker size)
- Feed phase (single / 3 phase)
- Reading information x 12 months (this may well be contained in a separate report.)

The above list is by no means complete but is considered the minimum critical information needed to make this assessment.

Despite several requests, this information was not received. After attendance of the MUNSOFT system overview training by the Zutari representative on 21 April 2022, it was determined that this information is not readily available from the MUNSOFT front end.

In this regard a letter of approval was obtained to obtain this information from MUNSOFT. This data was eventually obtained from Munsoft in a set of .CSV or .XLS exports. The filed received consisted of:

- Valuation Master File.xls
- CsmMeterMaster_KWADUK_S01_220614_114112.xls
- CsmMeterHist_KWADUK_202107-202206_S01_220614_115741.csv
- Consumer Master File.xlsx
- Consumer Erf Master.xls

This information was then combined into a single view SQL data file. The following fields were used to generate a unique 27-digit ERF code for purposes of using as primary key to link the information together:

- ERF_EXTENSION
- ERF_LOT_NUMBER
- ERF_SUB_DIVISION
- ERF_UNIT_NUMBER

From this view we were then able to make the following analysis and conclusions for this aspect.:

- There are 53 657 unique stands in the Munsoft data
- 233 Stands does not have a valid stand key and have been discarded in this analysis
- The table below provides an overview of stands, whether a customer is linked to the stand and whether a meter is linked to the stand.

Customer linked to stand		Linked Customer Status		Meter linked to Stand		Meter Type Linked		
Y	N	Active	Inactive	Y	N	Conventional	Prepaid	No Type
48953	4704	43707	5246	48953	4704	9405	11269	28279

- All stands with a customer linked, also have at least one meter linked to the stand
- A large number of meters have no type in the system

Below tables indicate the extent of account types of vs tariff code types for conventional meters as well as prepaid meters. The tables have been limited to the first three account types for ease of reading.

Conventional

Count of ERFKEY	ACCOUNT_TYPE_DESCRIPTION		
METER_TARIFF_DESCRIPTION	COMMERCIAL	DOMESTIC	FARM LAND
015 GROUP ACCOUNT	3		
020 GROUP ACCOUNT	4	16	
025 GROUP ACCOUNT		1	
026 GROUP ACCOUNT		3	
028 GROUP ACCOUNT		1	
030 GROUP ACCOUNT	1	2	
031 GROUP ACCOUNT			
032 GROUP ACCOUNT	1		
041 GROUP ACCOUNT		1	
042 GROUP ACCOUNT	1	1	
046 GROUP ACCOUNT		1	
070 GROUP ACCOUNT		2	
154 GROUP ACCOUNT		1	
156 GROUP ACCOUNT		1	
165 GROUP ACCOUNT	1	2	
171 GROUP ACCOUNT	2	6	
210 GROUP ACCOUNT		1	
215 GROUP ACCOUNT		1	
220 GROUP ACCOUNT			
400 GROUP ACCOUNT	1	5	
CR ADJUST ON OLD COMM TARIFF			
ELEC ARRANGEMENT		1	
ELEC COMM < 80 AMP NORTH	71	242	
ELEC COMM > 80 AMP SOUTH	90	134	
ELEC COMM < 80 AMP SOUTH	130	167	
ELEC COMM > 80 AMP NORTH	47	132	
ELEC DEPARTM < 80 AMP SOUTH		3	
ELEC DEPM MAX DEM UNITS SOUTH		1	
ELEC DOMESTIC NORTH	31	2165	3
ELEC DOMESTIC SOUTH	67	7449	5
ELEC FLAT KVA UNIT SOUTH	23	76	
ELEC FLATS KVA UNITS NORTH		2	
ELEC IRIGATION			
ELEC KVA UNIT NORTH	33	74	1
ELEC KVA OFF PEAK UNITS NORTH		1	
ELEC MAX DEM < 65 KVA SOUTH	60	109	1
ELEC MAX DEM UNITS >1000 SOUTH			
ELEC METERED STR LIGHTS SOUTH	1		
ELEC PENDING METERS	7	40	
ELEC PREPAID	11	118	
ELEC RELIGIOUS NORTH	7	25	
ELEC RELIGIOUS SOUTH	1	13	
ELEC SIZA COM > 80 AMPS	16		
ELEC SIZA COMM -80 AMPS	4	1	
ELEC SIZA COMM KVA UNIT	4	2	
ELEC STR LIGHT PRIVATE		7	
ELEC STREET LIGHTS SOUTH	2	4	
ELEC STREETLIGHTS NORTH	5	3	
ELEC SUGARMILL NORTH			
ELECTRICITY RELIGIOUS		1	
INDIGENT ELEC			
MD TIME OF USE			
TIME OF USE KWH OFF-PEAK			
TOU BASIC CHARGE < 65 KVA	1	4	
Grand Total	625	10819	10

Prepaid

Count of ERFKEY	ACCOUNT_TYPE_DESCRIPTION		
METER_TARIFF_DESCRIPTION	COMMERCIAL	DOMESTIC	FARM LAND
CR. ADJUST ON OLD DOM TARIFF	1		
ELEC COMM > 80 AMP NORTH			
ELEC DOMESTIC SOUTH		3	
ELEC PENDING METERS		1	
ELEC PREPAID	104	6514	2
PREPAID		2	
REFUSE COMM 6X WEEK NORTH		1	
(blank)	39	11107	1
Grand Total	144	17628	3

The table below depicts an analysis of stand with a blank account description as well as a blank Meter Tariff Description.

Count of ERFKEY	ACCOUNT_TYPE_DESCRIPTION	
METER_TARIFF_DESCRIPTION	(blank)	Grand Total
(blank)	29681	29681
Grand Total	29681	29681

We also learned that tariff codes are not hard coded in the MUNSOFT system to land use or zone codes, indicating that there is a risk of operator errors when accounts are being created and the required tariffs are linked to the account.

Observations:

- A lot of tariff descriptions are being used which seemingly does not link back to a tariff structure.
- Errors could be seen between the type of account and the tariff type. Commercial and domestic account types are for example linked to streetlight tariffs.
- A large number of stands (29681) have no tariff, nor account type description.
- In general, the data within Munsoft in our view requires a lot of data cleansing.

4.3.3.2 Assess adequacy, efficiency of institutional arrangements for meter installations & readings

Reference information obtained in this regard consist of:

- SOPB003 – Meter movement
- SOPB0006 – Meter reading
- SOPB004 – Prepaid

Additional reference information deemed necessary and requested but not received consist of:

- SOP for new connections (covered under the SOPB004 for prepaid new connections)
- SOP for connection upgrade
- SOP for connection removal
- Applicable policies

This assessment will therefore focus on the ones received.

4.3.3.2.1 SOPB003 – Meter movement

This SOP relates to the replacement of an electricity meter.

The SOP is highlighted in the table below.

Table 22: Meter Movement SOP

NO	PROCEDURE	RESP OFF
	Receipt and processing of meter movement forms	
1	Electrician/ representative from the Electricity Department/ Contractor presents the original meter change document to the Accountant Revenue/ Billing.	Accountant Billing
2	The Accountant signs the copy of each meter movement form received from the Electrician/ representative of Electrical department/ Contractor on the register and also signs the copy to be handed back to the Electrical Department.	Accountant Billing
3	The Accountant to keep a register of all received meter movements with 2 columns for signatures and dates. This is to be signed by Accountant Billing when allocating meter movement forms and by the Billing Controller/Prepayment Supervisor on receipt of the same.	Accountant Billing/ Billing Controller/ Prepayment Supervisor
4	Accountant to scan the meter movement, save a soft copy in the documents folder and hand the hard copy to the respective staff being Billing Controller or Prepayment Supervisor.	Accountant Billing
5	Billing Controller/Prepayment Supervisor is to: • Sign the register for receiving the meter movement form from the Accountant, • Scrutinize the meter movement form to ensure all the relevant fields have been completed by the Electrical department/ Contractor. The Billing Controller/Prepayment Supervisor is to contact the Electrical department/ Contractor if there is any information outstanding. • Process the meter movement form by updating the details/master file changes on the billing and prepayment systems and processing debit/credit adjustments if necessary. This is to be done with 5 days of receipt of the meter movement form. • Advice consumer of any changes made to his/her account [where adjustments had to be processed].	Billing Controller/ Prepayment Supervisor
6	Safely file the document in number order in the file clearly marked METER MOVEMENTS.	Billing Controller/ Prepayment Supervisor

Observations:

- SOP suggests that proper controls are in place from a finance management perspective to receive the necessary forms and process accordingly.
- It assumes that quality assurance of meter changes is controlled by the energy department, especially in the case of meters replaced by contractors.
- Although the accountant is required to scrutinize the form to ensure all fields are completed, it assumes that quality of information is 100% correct as completed by the energy department. Considerations needs to be given on how the energy department exercises quality assurance of installation and data to ensure integrity of data entering the financial system.

4.3.3.2.2 SOPB006 – Meter reading

The SOP is highlighted in the table below and covers the process of obtaining meter readings on conventional meters.

NO	PROCEDURE	RESP OFF
	Monthly meter reading processes	
1	Prepare a meter reading schedule monthly by taking the following into account: • Number of meters/routes to be read • Number of meter readers available • Dates by which readings must be completed to meet the deadline for billing, taking into account weekends and public holidays if applicable • Rotation of Meter Readers across routes The meter reading schedule is to be provided to the Manger: Billing, Accountant: Billing and all Meter Readers prior to the start of each reading cycle	Senior Meter Reader
2	Extract a meter reading route list from the financial system, without the prior month readings, for all meters that are to be read and forward to the Senior Meter Reader	Accountant: Billing
3	Print and distribute the meter reading route lists to the Meter Readers according to the meter reading schedule	Senior Meter Reader
4	Perform meter readings as meter reading schedule. The meter reading route list is to be completely read and valid comments are to be recorded where readings could not be obtained. There should be no meters on the list without a comment or a reading	Senior Meter Reader/Meter Readers
5	Ensure that completed route lists are submitted to the Senior Meter Reader immediately upon completion of a route and before commencement of reading a new route and that there is no deviation from the meter reading schedule	Meter Readers
6	Deviations from the meter reading schedule is to be reported on a daily basis to the Accountant Billing to ensure that mitigating measures could be effected	Senior Meter Reader
7	Completed meter reading route lists must be submitted immediately after receipt to the IT Data Capturer for capturing of meter readings	Senior Meter Reader
8	Capture meter readings onto the financial system and stamp the route list as “captured” once all readings have been captured	IT Data Capturer
9	Immediately after meter readings have been captured, create and analyze exception reports from the financial system to identify zero consumptions, negative consumptions and large consumptions, etc. in order to ensure that meters are captured correctly on the financial system	Billing Controllers
10	Create variance reports and submit to the Senior Meter Reader for onward allocation to the Meter Readers to follow up on zero consumptions, negative consumptions and large consumptions, etc.	Billing Controllers
11	Follow up, investigate, verify and correct meter readings on the financial system ,received from the Senior Meter Reader/Meter Readers, arising from the variance report readings received	Billing Controllers
12	Investigate, report and follow up possible problems/concerns, faulty meters, locked properties, access issues, bush, jammed meter kiosks, etc. to the responsible business unit and inform the consumer immediately	Billing Controllers
13	On a monthly basis, create exception reports for meters estimated for a period longer than 3 consecutive months and implement controls to investigate those and obtain meter readings	Accountant: Billing

14	Completed and captured route lists and variance reports where applicable are to be filed on a monthly basis (per region North and South), clearly labelled and in route number order together with the meter reading schedule.	Billing Controllers

- The SOP suggests that the process is still mostly a manual process, however confirmation was received that readings are captured on handheld devices and imported from the device into the system. SOP needs to be updated in this regard with a newer release.
- It is assumed that the reading files that are prepared without the previous month's readings is to eradicate abuse of the process by fabricating readings as opposed to getting actual readings. This is an advantage but could also be a disadvantage as meter readers cannot report when a meter does not register consumption.
- Meters that cannot be read are only reported as faulty without an indication of what the fault is. An indication of the reason for the meter being faulty will assist the energy department in addressing faulty meters. The MUNSOFT software does provide for a municipality to list fault reasons under the No Access field.
- A further advantage of a detailed fault list is that not all faults (No Access) will be the responsibility of the energy department wrt electricity meters. When access to a meter is problematic due to the reader not getting access to the property, a detailed No Access code may assist in flagging certain meters to be read after hours or getting the consumer to phone a reading in or sending a Whatsapp.

4.3.3.2.3 SOPB004 – Prepaid Meters

This SOP covers the process of a new connection for a Prepaid meter as well as a meter replacement.

The SOP is highlighted in the table below.

NO	PROCEDURE	RESP OFF
	Master file amendments to the prepayment database	
A	**NEW CONNECTIONS**	
	• Receiving applications for new connections/new meter registrations from the Consumer • Make a copy of the Certificate of Compliance (COC) and Consumers ID and attach to the application form • Process the application by updating the master file of the prepayment database. Ensure that all relevant fields are accurately and completely updated (Name, Surname, Identity Number, Address, Next of Kin, Contact Details, etc.) • Update the same information on the Daily duties spread sheet for statistics purposes	Prepaid Clerk/ Relief Clerk/ Prepayment Supervisor
B	**METER CHANGES/REPLACEMENTS**	
	• Receives meter movement forms for meters that were replaced/changed from Consumer • Scrutinize the meter movement form to ensure all the relevant fields have been completed by the Electrical department/ Contractor. Refer this to the Prepayment Supervisor, who is to contact the Electrical department/ Contractor, if there is any	Prepaid Clerk/ Relief Clerk/ Prepayment Supervisor

	information outstanding • Extract a purchases report on the old meter number and analyse purchasing pattern. Should the purchasing pattern be irregular/there are no purchases or a long period, refer this to the Prepayment Supervisor who is contact the Electricity Department to inform them of the same and enquire the reason for the meter change and is there was a case of tampering. Illegal/direct connections establish whether the Consumer was issued with a tamper fine and it was paid. • Process the meter change, only if the above is in order, on the prepayment system by using the "meter change" field and record all relevant information (old meter number, new meter number, reason for change, etc.) and also update/confirm Consumers contact details • Record all meter changes information on the daily duties spread sheet for stats purposes	

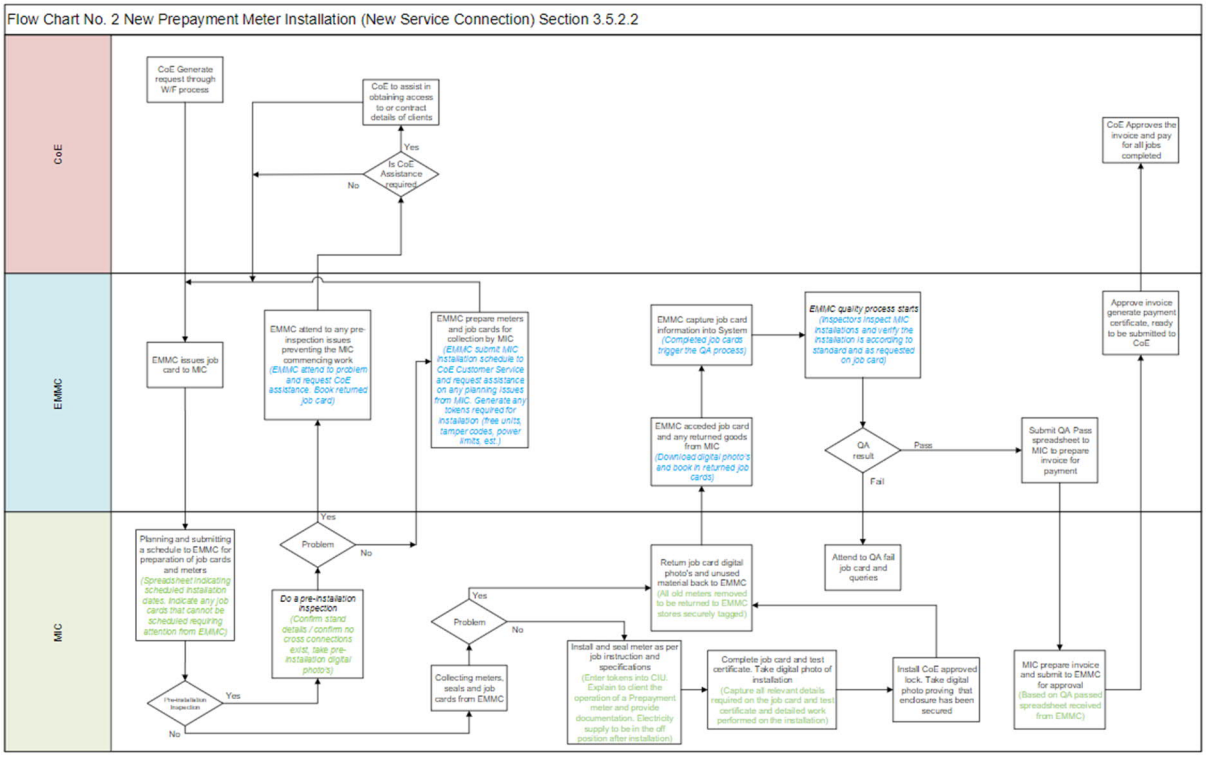
Observations:

- For new connections:
  - The process only highlights receiving of an application form from a consumer and processing on the prepayment database. This database is understood to be separate from the MUNSOFT financial system. Since the consumer must present to CoC as well, it indicates a process of meter installation prior to this process as a CoC can only be issued once a meter installation has been completed.
  - The SOP is silent on where the prepaid meter information will come from, consumer / electricity department and whether the consumer must first approach the electricity department for a meter installation.
  - There is also no indication of whether the prepaid meter number is recorded on the financial system as well. It seems that it only happens in the prepaid data base and therefore no link back the financial system for a complete customer data base overview.

- For meter changes / replacements
  - The SOP only highlights the process of the preplacement of a prepaid meter with a prepaid meter. Replacement of a conventional meter with a prepaid meter is not mentioned in any of the SOP's received for review.
  - It mentions that the meter change / replacement form is received from the consumer and not the electricity department. This is viewed as a risk as it involved one more stakeholder in the process allowing for more opportunities for things to go wrong.
  - It assumes that quality assurance of meter changes is controlled by the energy department, especially in the case of meters replaced by contractors.
  - Although the accountant is required to scrutinize the form to ensure all fields are completed, it assumes that quality of information is 100% correct as completed by the energy department. Considerations needs to be given on how the energy department exercises quality assurance of installation and data to ensure integrity of data entering the financial system.
  - There is also no indication of whether the prepaid meter number is recorded on the financial system as well. It seems that it only happens in the prepaid data base and therefore no link back to the financial system for a complete customer data base overview.

4.3.3.2.4 SOPs in general

- It is recommended that SOPs are reviewed and replaced with a process flow type with “swim lanes” for each stakeholder (department / consumer / contractor etc) indicating each one’s responsibilities in this regard. Below illustration is an example of such a process for with “swim lanes”



- SOPs are usually informed by policies. It is recommended that the applicable policy be referenced in the SOP as well.

4.3.3.3 Assess adequacy, effectiveness & efficiency of financial systems

Adequacy, efficiency & effectiveness had to be assessed wrt:

- Metering & billing
- Historical payment levels
- Collections
- Cost Recovery
- Implementation of credit control policies
- Ring-fencing of electricity accounts
- Free basic electricity
- Credit control & debtor management
- Revenue enhancement

- Customer account management

Reference information received in this regard consist of:

- Vuthela PFM data cleansing project report
- At least a 6-month meter reading & consumption history for all electricity meters
- 12-month billing data of all electricity meters
- 12-month purchase history for prepaid meters
- SOP for prepaid metering
- SOP for PP vending system
- Meter reading error report (faulty meter report)
- SOP for disconnection of non-paying customers
- KDM revenue enhancement program 09-2020 document

Reference information considered to be critical but not received consisted of a complete customer data set.

From the assessments it was determined that KwaDukuza use the following systems:

- MUNSOFT integrated Financial Management & Internal Control System – this is the main system in use for all aspects of financial management & control within the municipality.
- Contour Technology providing the platform and service for prepaid electricity vending.
- Automated Meter Reading (AMR) service provider for certain High Use Customers

MUNSOFT

To obtain a good understanding of the MUNSOFT software, Zutari had a representative attend a system overview training session at the MUNSOFT head office in Roodepoort. Key take aways from this session were:

- MUNSOFT is mSCOA (Municipal Standard Chart of Accounts) compliant. mSCOA was implemented in July 2017 by National treasury with the aim of improving data quality & integrity and a uniform method of financial reporting.15 Business processes are defined within mSCOA that encapsulates all aspects of municipal financial management.
    - Corporate governance
    - Municipal budgeting, planning & financial modelling
    - Financial accounting
    - Costing & reporting
    - Project accounting
    - Treasury & cash management
    - Procurement cycle:
        - Supply chain management
        - Expenditure management

        - Contract management
        - Accounts payable
    - Grant management
    - Full asset life cycle management including maintenance management
    - Real estate & resource management
    - Human resource & payroll management
    - Land use & building control management
    - Valuation roll management
    - Revenue cycle:
        - Meter reading
        - Billing accounts receivable
        - Revenue management
        - Receipting
    - Customer care, credit control & debt collection

- From the above it is clear that KwaDukuza municipality is making use of a compliant system covering all aspects of financial management
- Quarterly software updates are released to ensure the MUNSOFT system stays mSCOA compliant.
- Annual releases also take place to align the software to changes within mSCOA. Refresher courses are provided by MUNSOFT in this regard, either in person or virtual.
- Manuals of all processes within MUNSOFT are available withing the system for all operators to download and improve their knowledge.
- At least 68 local and district municipalities make use of the MUNSOFT software.

SUPPLEMENTARY SYSTEMS

The AMR system and the Prepaid vending system can be seen as supplementary systems to the main financial management & control system, serving a specific purpose.

Prepaid vending systems need to be STS compliant. STS stands for Standard Transfer Specification and is the global standard for the transferring of electricity and other utility prepayment tokens to ensure inter-operability between system components of different manufacturers. The STS association website confirms Contour Technology as an STS member, implying that their system is STS compliant.

<u>Observations</u>

- We can confirm that KwaDukuza indeed make use of compliant systems
- Integration of systems does seem a bit of a challenge. Refer to the section on SOP's where we highlighted that it does not look as if prepaid meter information gets recorded within the financial system but is only housed within the prepaid system. This means that the main system does not contain full details of customers with prepaid meters. We are of

the view that all meter information management should start within the main system to eradicate reliance on third party / supplementary systems.

- As indicated previously MUNSOFT is comprehensive and various reports are available, however the system cannot produce an overall customer data set as highlighted under 4.3.3.1.
- It also does not seem that there is a process of data verification prior to capturing / importing data into the system. This may lead to data of questionable quality being captured / imported, leading to subsequent data integrity issues. From the RUMAS report on data cleansing of June 2021, it seems that a data cleansing process did indeed take place. As previously reported though certain data quality issues were identified such as missing account numbers in the billing data files and AMR meter number differs issues between AMR reading data and billing data.

4.3.3.4 Assess integrity, completeness & accuracy of energy customer data base

Integrity, completeness & accuracy had to be assessed wrt:

- Existing spatial development
- Actual number of end users
- Reconciling of customers in valuation roll to deeds office and / or SG listing.
- Completeness of info on billing system.

Reference information received in this regard consist of the KDM cadastral data, the valuation roll, as well as the Munsoft Customer data base.

A comparative analysis was done between the cadastral data and the valuation roll. The table overleaf provides a summary overview of the analysis.

Item	Cadastral	Valuation roll	Munsoft Customer Data base
Stand records	34438	50236	72655
Stand showing multiple times	6	2111	10978
Unique stand records	34426	47852	53890
Stands having SG21code		45552	47206
Stands showing same SG21code 3 times		831	
Stands showing same SG21code 2 times		1648	
Stands without SG21code		11623	6684
Stands with correct SG21 code length		33385	34614
Stands with incorrect SG21 code length		12168	18075

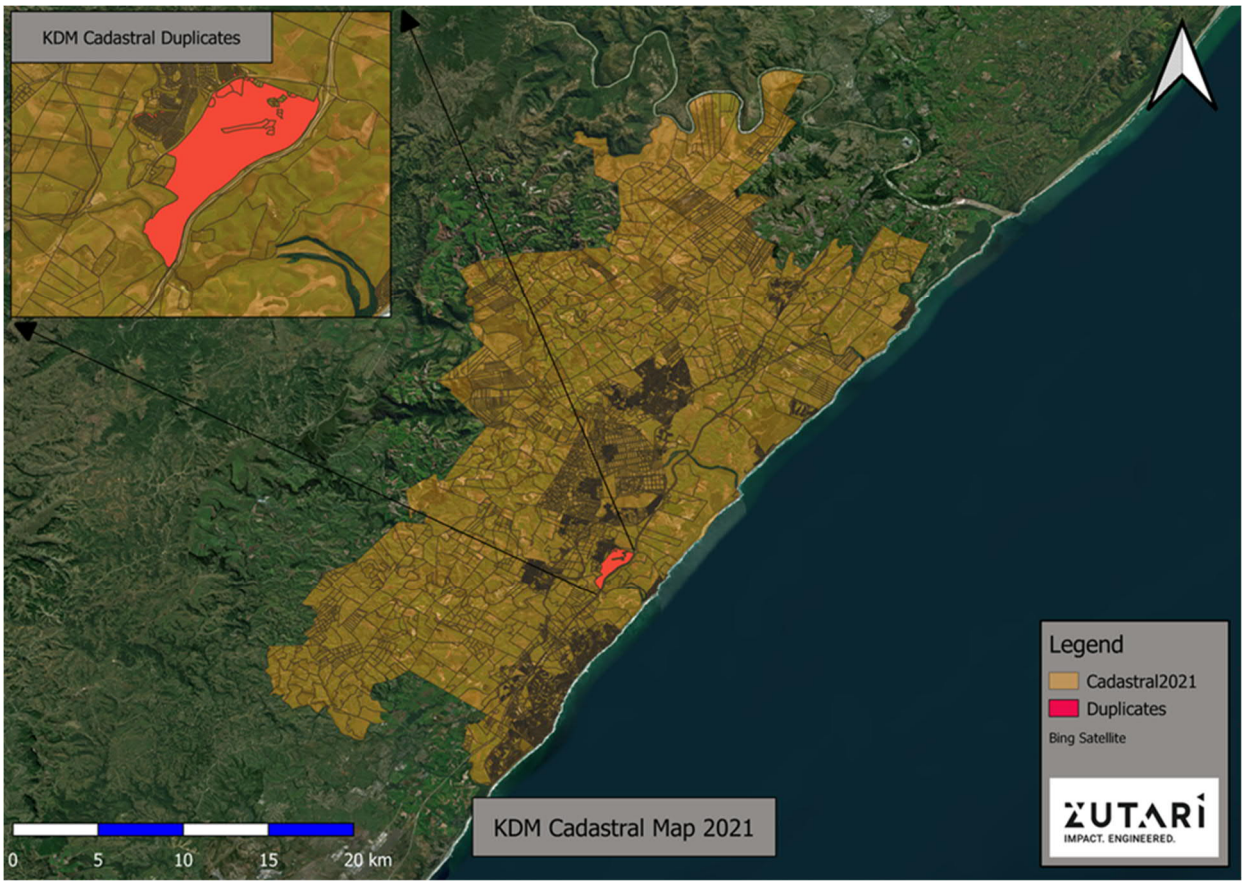
It was also observed that 4 409 stands have multiple prepaid meters linked to it. Below table indicate the top 20 stands in this regard. A possible explanation for this is the linking of multiple meters on

sectional title stands, as opposed to bulk supplying these stands and leaving downstream metering to the responsibility of the governing body.

	PRE-PAID		PRE-PAID Total
ERFKEY	ACTIVE	INACTIVE	
CB###~000005451~000000~0000	130	23	153
RP###~000007704~000000~0000	59	15	74
GV###~000000967~000000~0000	47	1	48
CB###~000000284~000000~0000	45		45
STG##~000009062~000000~0000	35		35
CB###~000000127~000000~0000	31		31
CB###~000000077~000000~0000	22	2	24
CB###~000000168~000000~0000	23		23
CB###~000002390~000000~0000	22		22
GV###~000000872~000000~0000	19		19
NP###~000003297~000000~0000	14	4	18
CB###~000002692~000000~0000	18		18
CB###~000000161~000000~0000	17		17
GV###~000001086~000000~0000	16		16
STG##~000003208~000000~0000	12	2	14
GV###~000000890~000000~0000	14		14
CB###~000000123~000000~0000	14		14
STG##~000008498~000000~0000	7	6	13
STG##~000008499~000000~0000	12	1	13
GV###~000001104~000000~0000	12	1	13
GV###~000001153~000000~0000	13		13

Observations

- As cadastral data makes use of the unique 21-digit Surveyor general stand code as the primary key, duplicates in records should not occur. Six stands however do duplicate. See below map of the cadastral data. The stands in red are the ones duplicating and require further investigation.
- Officially KDM should thus have 34 438 registered stands. The valuation roll and the Munssoft Customer data base however have quite a bit more than this with various forms of anomalies. This is viewed to be indicative of a data quality issue within the MUNSOFT financial system. It is assumed that the valuation roll is drawn from the same customer data base from which electricity customers are managed.
- Our conclusion is that a lot of data cleansing is needed to align what is in the cadastral data with the valuation roll and the customer data base.



4.3.3.5 Review report on Customer Relations Management System and / or Information Systems

Reference information received in this regard consist of:

- Vuthela CRM technical feasibility report by ZTE Consulting dated 30 June 2020.
- Strategic plan for the iLembe Regional Customer Care centre by ZTE Consulting dated 19 June 2020

Observations / Commentary

- The feasibility study is a supporting document to the strategic plan in terms of implementing the Customer Care Centre with supporting CRM system.
- A regional Customer Care Centre with a supporting CRM system will go a long way in improved service delivery to the residents of iLembe and its member municipalities. It will also provide a uniform process through which customers can log queries / complaints. The same system can even be used for customers to send in readings of their meters in order to improve on percentage readings onto bill. In this regard also refer our comments regarding the SOP for meter reading.
- A system where escalation levels exist for the resolution of queries to hold officials accountable is supported. This can be linked to a customer service delivery charter with specified timeframes to resolve certain queries.

- Our experience in this regard, having been involved with a leading metro supports that such a system can provide benefits. As the feasibility report indicates, the success of such a process and system is dependent on officials taking ownership and responsibility. We have experienced officials taking responsibility and trying their level best to provide service, and we have seen officials manipulating the system. It implies consequence management needs to be taken seriously as well.
- It does not seem as if centre and system went live by the intended time.

4.3.3.6 Assess billing & revenue collection re electrical services provision

Aspects to assess included:

- Accuracy of billing
- Billed vs collected revenue
- Returned mail billings
- RD cheque register
- Unallocated receipts
- Clearing of suspense accounts
- Updating of debtors' ledgers.

Reference information considered relevant and requested consist of:

- Customer data base with reading and billing history
- Billed revenue vs collected revenue report
- Returned mail billings report
- RD cheque register
- Unallocated receipts report
- Unallocated receipts procedure
- SOP's related to revenue management / protection

The only records received consisted of meter readings and billing history as well as prepaid purchase history report.

Observations:

<u>Conventional meters</u>

- When it comes to conventional meters, the first goal should always be to obtain a high as possible % readings onto bill. Put another way, as few as possible customers should be billed interims / estimates for two reasons:
    - Customers are more willing to pay for services when they can see what their actual consumption is.
    - All meters should be read at least once in 90 days. Meters not read for more than 90 days, and subsequently billed interims / estimates lead to audit queries. This is

considered a huge challenge for all municipalities with no simple solution as the reasons for meters not being read are many.

- An analysis of the billing data received indicates that approximate 52% of customers are billed estimates as of September 2021. This is a significant increase from accounts estimated in May 2021 of 27%. In our opinion a benchmark of at least 90% readings onto bill should be achieved.
- No interim / estimated billing report was received. From the billing history one can deduce though that a significant number of meters are being estimated for periods longer than 3 months.

Prepaid meters

Prepaid purchase history was received for the period July 2020 to June 2021.

The history contains records of 51 025 unique prepaid meter numbers with a 12 month purchase history.

An analysis of the purchase history revealed that:

- On average 27 725 (54%) meters show zero purchases
- 21 493 (42%) meters show no purchases for the entire year.
- 5 481 meters have no records of address, town, or consumer name.
- Total prepaid meters are more than registered stands as per cadastral data.

Conclusion:

- Just with the information received it is clear that KDM faces a huge challenge with percentage readings onto bill (meters that are estimated) and prepaid meters that are not purchasing.
- KDM is bleeding revenue in this regard.
- Credit control cannot be implemented as it should due to the high number of accounts estimated.
- As previously indicated, there seems to be no link back between the financial system and the prepaid vending system, leading to incomplete customer records. Without complete customers records it is going to be very difficult to determine whether all KDM customers are metered (conventional or prepaid) or not.
- Even though a cleansing exercise was undertaken, a lot more work is needed in this regard.

4.3.3.7 Investigate necessity of tariff study and review

Reference information received in this regard consist of the draft Tariff policy for 2021-2022.

Based on answers to a question posed to the Municipality, a tariff study has not been undertaken in the last few years.

Observations:

- The policy is understood to be a policy document for all tariffs to be levied to customers. It however only speaks to Electricity and Refuse removal.

- A search of the KDM website was done, but tariffs could not be found, although there are all sorts of other documents such as the valuation roll, policies etc. We are of the view that tariffs also be published to the website so that consumers can be informed.

Conclusion:

- A tariff study could well be considered, not just for KDM, but for the whole of iLembe.
- There are other factors though that places a bigger burden on revenue collection and protection as highlighted under section 4.3.3.6. A tariff study may indicate whether KDM can collect sufficient revenue from their customers to cover expenses. It is not going to ensure though that the revenue is correctly billed and collected.

4.3.3.8 Review completed Indigent register study

The following aspects had to be reviewed based on the completed study:

- Community awareness
- Formal indigent applications and verification thereof
- Assessment of completeness status of indigent register
- Billing of indigents

The reference information in this regard consisted of the close out report titled “Alignment of Indigent policies, Uniform systems and processes for maintaining the indigent register across municipalities” by Bonakude Consulting (Pty) Ltd.

Observations:

- Community awareness
    - The report only mentions community awareness once as a strength of the municipality to perform road shows and awareness campaigns to encourage the community to register for indigent status.
- Formal applications and verification thereof
    - The report highlights the following as a weakness:
        - No systems in place to ensure that everyone who qualify as indigent, are indeed registered as such.
        - No systems in place to vet indigent applications, increasing the risk of someone not meeting the criteria being registered as indigent
        - Indigents are not flagged in the system, resulting in indigents being billed as normal debtors.
- Assessment of completeness status of indigent register:
    - The same systems shortcomings as highlighted above, also implies that the indigent register is far from complete / accurate
- Billing of indigents
    - The report highlights that fact that indigents are not flagged in the system and as a result run the risk of being billed as normal debtors. This is highlighted in the report as a weakness and threat.

Conclusion:

The report recommends the establishment of a centralised repository for indigent management, that is web and cloud based, is secure and have audit trail functionality.

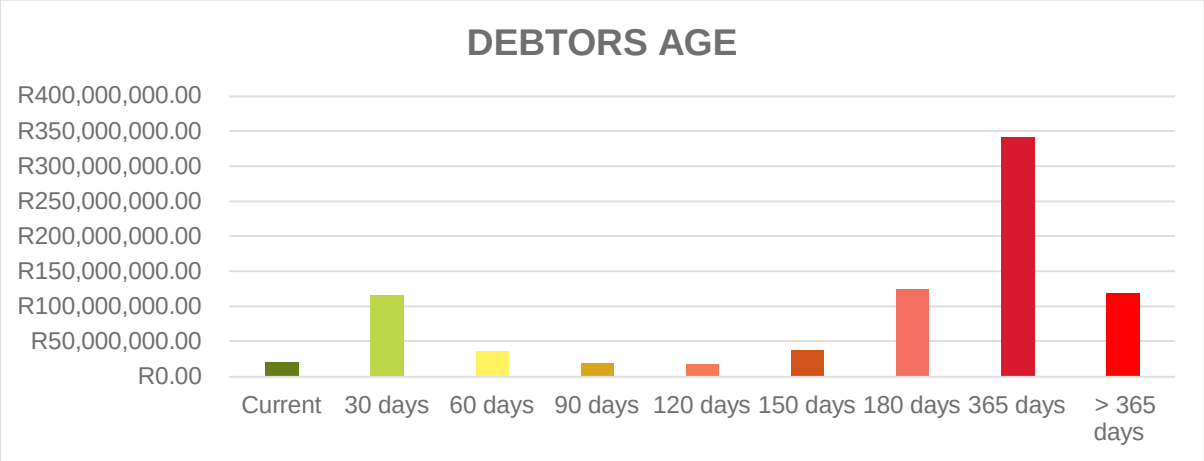
4.3.3.9 Review of Debt management

The following aspects had to be assessed in this regard:

- Review of monthly debtor's age analysis
- Percentage of debt outstanding more than 90 days
- Review of credit control measures
- Follow up of existing payment arrangements in place.
- Councillor involvement in debtor management

A debtor's age report was received as of June 2022. Below table and graph provides and overview of the age analysis of the debtor's book:

Age	Value	% Of Book
Current	R20,204,442.95	2.43%
30 days	R116,573,562.09	14.03%
60 days	R36,298,274.35	4.37%
90 days	R19,177,903.16	2.31%
120 days	R17,870,373.57	2.15%
150 days	R37,519,745.14	4.52%
180 days	R123,700,002.90	14.89%
365 days	R341,083,569.75	41.06%
> 365 days	R118,264,267.30	14.24%
Total	**R830,692,141.21**	**100.00%**



The table below provides an overview of the debtors age per customer type:

ACCOUNT_TYPE	Sum of Current	Sum of 30 Days	Sum of 60 Days	Sum of 90 Days	Sum of 120 Days	Sum of 150 Days	Sum of 180 Days	Sum of 210 Days to 1 Year	Sum of Over 1 Year	TOTAL
COMMERCIAL	-R 2,149,745.06	R 27,632,277.84	R 3,353,181.45	R 1,416,950.27	R 1,266,404.76	R 249,117.95	R 256,075.23	R 877,142.58	-R 4,530,523.45	R 28,370,881.57
DOMESTIC	-R 1,122,047.30	R 65,416,945.68	R 17,853,052.99	R 8,916,963.22	R 7,084,387.01	R 5,225,958.25	R 3,659,138.75	R 21,718,507.18	R 101,054,374.24	R 229,807,280.02
FARM LAND	R-	R 278,991.20	R 29,328.80	R 23,278.23	R 25,763.13	R 17,957.26	R 27,520.38	R 117,875.54	R 467,328.32	R 988,042.86
GOVERNMENT	-R 1,786.21	R 2,202,720.04	R 35,125.25	R 70,031.77	R 59,947.45	R 62,904.66	R 447,251.94	R 444,921.96	R 1,564,610.85	R 4,885,727.71
KDM PROPERTY	-R 5,216.94	R 674,687.26	R 267,882.19	R 304,387.05	R 65,601.84	R 51,712.21	R 57,526.20	R 310,387.14	R 1,419,443.60	R 3,146,410.55
LAND AFFAIR	-R 750.00	-R 5,106.66	R 1,316.85	R 931.51	-R 2,285.41	R 826.22	R 3,765.68	R 32,461.07	R 77,907.67	R 109,066.93
SCHOOL	-R 500.00	R 16,731.17	R 4,946.93	R 4,642.21	R 4,120.54	R 4,589.87	R 28,882.40	R 79,172.06	R 65,994.64	R 208,579.82
STATE OWNED	R-	R 7,132.51	R 2,820.19	R 2,362.61	R 2,345.78	R 2,346.25	R 29,622.17	R 44,013.26	-R 39,398.63	R 51,244.14
TO BE DEFINED	R-	R 3,986.83	-R 396.24	R-	R-	R-	R-	-R 0.24	-R 11,862.54	-R 8,272.19
(blank)	R 23,484,488.46	R 20,345,196.22	R 14,751,015.94	R 8,438,356.29	R 9,364,088.47	R 31,904,332.47	R 119,190,220.15	R 317,459,089.20	R 18,196,392.60	R 563,133,179.80
Grand Total	R20,204,442.95	R116,573,562.09	R36,298,274.35	R19,177,903.16	R17,870,373.57	R37,519,745.14	R123,700,002.90	R341,083,569.75	R118,264,267.30	R830,692,141.21

The Top 25 debtors are listed in below table:

ACCOUNT_NO	ACCOUNT_HOLDER	ACCOUNT_TYPE	STREET_ADDRESS	Current	30 Days	60 Days	90 Days	120 Days	150 Days	180 Days	1 Year	> 1 Year	Total
7013198	M & P DEV.PTY LTD	DOMESTIC	44 LEE BARNES BOULEVARD CALEDON ESTATE CALEDO	R -	R 47,016.98	R 46,770.59	R 35,033.75	R 46,407.36	R 34,540.97	R 34,294.57	R 202,127.90	R 2,320,586.79	R 2,766,778.91
7021027	NORTHGLOBAL PROPERTIES PTY LTD	DOMESTIC	ELALENI COASTAL FOREST ESTATE 910	R 85,159.77	R 102,792.16	R 361,619.91	R 4,368.32	R 4,368.32	R 4,515.45	R 107,922.72	R 523,653.17	R 1,034,280.87	R 2,228,680.69
3005363	MSOMI MSOMI INV (PTY) LTD	DOMESTIC	LEADWOOD CLOSE 3	R -	R 9,758.69	R 9,718.32	R 5,298.03	R 5,257.65	R 5,217.28	R 5,176.91	R 35,655.56	R 1,023,619.27	R 1,099,701.71
2081198	(B)ZWELABANTU DUBE CPA	DOMESTIC	FARM NEW GUELDERLAND NO. 1404 POR 91	R -	R 15,751.26	R 15,509.90	R 15,269.80	R 15,290.33	R 15,656.11	R 16,710.46	R 74,379.17	R 946,115.95	R 1,114,682.98
7018071	BCR DEVELOPMENTS PROPRIETARY LTD		NEW GUELDERLAND NO.3 POR 5	R -	R 24,871.77	R 9,360.75	R 583.91	R 9,232.89	R 181.87	R 4,830.85	R 42,346.73	R 903,699.39	R 995,108.16
2185398	HESTO HARNESSES	DOMESTIC	GLEDHOW MILL ROAD 1	R -	R -	R -	R -	R -	R -	R -	R 8,886.28	R 764,066.42	R 772,952.70
2080725	(B)ZWELABANTU DUBE CPA	DOMESTIC	FARM NEW GUELDERLAND NO. 1404 POR 91	R -	R 17,591.61	R 16,982.29	R 16,895.55	R 17,500.53	R 17,581.66	R 17,488.61	R 83,790.63	R 721,876.13	R 909,707.01
5112464	ROOPSINGH & SONS###	COMMERCIAL	MAIN ROAD 57	R -	R 18,290.49	R 16,539.99	R 17,239.19	R 17,241.37	R 15,016.53	R 14,458.57	R 62,309.94	R 669,733.33	R 830,829.41
3546199	PHINDANA PROPERTIES 217 PTY LT	DOMESTIC	MAHATMA GANDHI STREET 1	R 12,987.44	R 24,020.76	R 13,078.78	R 11,484.67	R 11,610.39	R 11,341.03	R 11,442.33	R 59,811.87	R 597,325.68	R 753,102.95
5603842	(R)JAYESEM 34 PTY LTD	DOMESTIC	SEA VIEW DRIVE 252	R -	R 5,658.38	R 5,635.33	R 3,222.31	R 3,199.28	R 3,176.23	R 3,153.18	R 20,257.11	R 582,906.22	R 627,208.04
7011034	BARLOWORLD LOGISTICS AFRICA PT	DOMESTIC	BALLITOVILLE 3719	R -	R 21,815.82	R 21,679.37	R 18,325.79	R 17,062.36	R 16,926.95	R 16,791.53	R 97,310.73	R 571,368.99	R 781,281.54
5605374	ESTATE LATE SAMUEL J M	DOMESTIC	OCEANVIEW DRIVE 57	R -	R 3,891.92	R 3,878.30	R 1,869.42	R 1,855.79	R 1,842.17	R 1,828.55	R 13,085.10	R 547,022.16	R 575,273.41
5609107	BADUL A & AMOD K S	DOMESTIC	SEAVIEW DRIVE 98	R -	R 2,675.87	R 2,674.85	R 480.15	R 479.12	R 478.10	R 3,210.88	R 32,955.34	R 536,467.76	R 579,422.07
2058496	SIMSI PROJECT MANAGEMENT CC	DOMESTIC	TOWNVIEW ROAD 23	R -	R -	R -	R -	R -	R -	R -	R 6,147.98	R 531,377.23	R 537,525.21
5382831	NAIDOO A		YELLOWWOOD DRIVE PORT ZIMBALI 62	R -	R 7,041.32	R 7,306.54	R 6,275.32	R 6,818.99	R 3,907.52	R 3,877.05	R 49,130.08	R 530,525.92	R 614,882.74
1121651	GEARWISE PROPERTIES CC	DOMESTIC	ERF 9046 STANGER	R -	R 3,590.66	R 3,588.19	R 547.10	R 544.63	R 542.16	R 539.69	R 44,018.81	R 523,140.54	R 576,511.78
1138889	ESTATE LATE PARVATHY &SOTHERS	DOMESTIC	TOWNVIEW ROAD 61	R -	R 10,680.90	R 9,605.39	R 9,516.50	R 10,517.98	R 8,344.57	R 10,910.99	R 58,684.24	R 522,833.93	R 641,094.50
5211186	(B)GOVENDER V	DOMESTIC	ROSEHILL ROAD 0	R -	R 6,544.71	R 5,122.91	R 6,382.12	R 6,939.09	R 5,622.22	R 6,645.40	R 29,242.81	R 501,607.68	R 568,106.94
5602817	R S A NATIONAL PUBLIC WORKS	GOVERNMENT	OCEAN VIEW DRIVE 59	R -	R 3,022.33	R 3,022.33	R 1,391.66	R 404.65	R 404.65	R 5,260.50	R 53,779.49	R 487,550.81	R 554,836.42
6004799	MODISANE M D L A & P P D	DOMESTIC	GINGER BEER ROAD 162	R -	R 2,267.15	R 2,261.20	R 893.61	R 887.66	R 881.71	R 875.77	R 14,605.82	R 461,410.57	R 484,083.49
7010392	JBV LOGISTICS CC	DOMESTIC	ZIMBALI SOUTH 1	R -	R 8,437.48	R 8,393.37	R 5,673.85	R 5,629.73	R 5,585.62	R 5,541.52	R 34,613.29	R 457,656.35	R 531,531.21
1122888	PADBRO INVESTMENTS & 6 OTHERS	DOMESTIC	KING SHAKA STREET 19	R -	R 9,103.41	R 8,948.08	R 7,111.67	R 7,128.00	R 7,040.70	R 6,986.26	R 39,082.92	R 423,604.87	R 509,005.91
6001244	NOETH J A	DOMESTIC	GINGER BEER ROAD 158	R -	R 2,717.32	R 2,709.53	R 1,126.66	R 1,118.85	R 1,111.06	R 1,103.27	R 9,547.64	R 422,887.29	R 442,321.62
7019233	MNISI FAMILY TRUST	DOMESTIC	WATERWOOD DRIVE PORT ZIMBALI 3	R -	R 12,535.62	R 29,767.88	R 10,297.64	R 11,497.80	R 9,483.72	R 12,093.62	R 65,983.70	R 414,106.25	R 565,766.23
5019907	ESTATE LATE NAICKER A & S	DOMESTIC	MILKWOOD DRIVE 33	R 2,509.76	R 3,415.58	R 3,401.96	R 1,908.13	R 1,894.50	R 1,880.88	R 1,867.26	R 12,248.55	R 411,874.59	R 441,001.21

Observations:

- General overview
  - 55% (R 459 347 837) of the total debtor's book is older than 180 days
  - 77% (R 638 437 958) of the debtor's book is older than 90 days
  - This is considered an unhealthy situation and indicates that current credit processes are ineffective in collecting revenue from KDM customers.
  - Debtors book does not specify which portion is for electricity billing.

- Overview per customer type
  - Of the identified customer types, domestic customers owe the largest amounts to KDM, with over R 100m older than 365 days.
  - Of the top 25 debtors, except for one government customer, one commercial and two that do not have a customer type, all the others are flagged as domestic customers.
  - Judging by the customers names though, it appears that at least 11 of those flagged as domestic, should be commercial.
  - The biggest portion (68%) is however not linked to any customer type (blank).
  - Both the last two bullet points are a further indication of possible data quality issues within the KDM financial system.

4.4 Community / End-user Awareness Communication & Campaigns

4.4.1 Overview

Although this section is contained in the ToR as a sub-section of section 3, we felt it important to separate into a separate section.

The ToR for this section read as follows:

"Assess the adequacy and effectiveness of any existing efforts by the relevant Business units or Departments or Directorates of the municipalities regarding the implementation of effective community and end-user awareness campaigns and initiatives designed to influence and change community behaviour and attitudes towards minimization of non-technical electricity losses, payment for services, appreciation and use of electricity, care of end-user infrastructure and facilities, etc. The consultant is also expected to assess the current measures in place to curb illegal connections and electricity theft in the KDM and MLM. Community awareness initiatives on the dangers and impacts of electricity theft as well as issues around poverty and inequality will need to be taken into consideration. An example is the current KDM Stakeholder engagement programme through the Masakhane Campaign Team to educate the community about the dangers and outcomes of illegal connections."

4.4.2 Detail Deliverable Breakdown

Table 23: End User Awareness Deliverable Breakdown

Main Deliverable	Number	Assessment Item	Reference Material	Source
4. Community / End-user awareness / behaviour change / electricity theft	4.1	Include assessment of current measures to curb illegal connections / theft	Masakhane Campaign info (T)	Any
			Communication & stakeholder engagement policy (Z)	Any
	4.2	Take into consideration community awareness re dangers & impact of electricity theft against issues such as poverty & inequality	Any other community awareness initiatives? (Z)	Any

4.4.3 Situational Analysis Findings

Zutari attended a meeting with the KDM Communications department, through Mr Sifiso Zulu and Mrs Thandeka Mkhize. The following items were discussed:

- Community awareness of the dangers of electricity theft and illegal connection
- Programmes in place regarding community involvement and awareness
- The implementation of the Masakhane Campaign
- Initiatives in place to educate the community with regards to electrical issues

There are currently no programmes or initiatives in place within KDM regarding any community awareness of the dangers of electricity theft and illegal connections. Flyers are sent out on rare occasions, but these involve the indigent population register only.

The Masakhane Campaign has not been implemented since 2017 up until the previous mayor had vacated the position and was seen as not being of any great success or benefit to the community.

The Communications team are still to send through any policies in place, as they were unsure if there were any available.

In summary, there are no community awareness programs in place at KDM with regards to electricity.

5 STATUS QUO REPORT SUMMARY & CONCLUSION

5.1 Situational Analysis

5.1.1 Key Network Installations

The KDM network data has been derived from previous studies and assessments which include Electricity Master Plans, Asset Verification Projects, Asset registers, network drawings and GIS data. The information available illustrates network interconnectivity from Bulk Supply to Distribution level with no information on the LV networks.

The information available specific to key network installations are available in the following formats,

- 33kV Single Line Diagrams (incl. Eskom Intake Points)
- 11kV Single Line Diagrams
- GIS layers of all the 33kV and 11kV infrastructure such as substations, switching substations, cables, overhead lines, mini substations, and transformers
- GIS Layers of Eskom bulk infrastructure
- Asset Register

The data available is a fair representation of the current 33kV and 11kV distribution system, however it must be noted that these drawings and GIS data sets are not being revised by KDM on an ongoing basis and as a result the information available is not current.

This assessment has identified that there is a need to develop additional data sets such as,

- Spatial layer for LV kiosks
- Spatial layer for electricity meters
- Spatial layer with Customer network link

5.1.2 General Infrastructure Assessment

It can be noted that the KwaDukuza Distribution networks have been in service for many years and much of the network is aged however still functional. The infrastructure assessment is based on previous assessments such as master plans and asset verification projects. The current asset register does not have a consistent naming convention to identify electrical assets with limited condition ratings across equipment.

The following can be noted with respect to substations,

- From the 13 existing substations, eight are between 25 and 45 years old which indicates a need for ongoing preventative maintenance.
- The transformers are typically in the adequate to good category with some of the transformers being refurbished in recent years with additional refurbishment needs at other substations.
- The switchgear is also in the adequate to good range with some of the switchgear being replaced over recent years. There is however a need to replace aged switchgear as well as oil switchgear that is still used in the network and poses a risk.

The following can be noted with respect to switching substations,

- Based on the condition identified across switching stations it can be noted that many are aged and fall within the marginal to adequate rating, however still functional. These will require

refurbishment and replacement of equipment within the medium term. Some switching stations are in good condition and have been refurbished or replaced within recent years.

- From the 36 switching substations around 35% are within the marginal category which indicates defective components and exceedance of useful life. Much of this switchgear are oil and in need of replacement.

With respect to the 33kV and 11kV cables and lines, no detailed assessments have been conducted previously only high-level assessments during the 2016 Master Plan Revision. It can however be noted that the 33kV lines and cable are considered to be in fair condition with minimal failures over time and are sized adequately for the current network load. The 11kV lines are upgraded on a yearly basis per section based on condition assessments as part of the KDM MV Upgrade Projects.

5.1.3 General Assessment of Metering & Meter Reading for bulk purchases

Eskom
Three Eskom intake points consisting of:

- Stanger
- Driefontein
- Shakaskraal

Analysis was done on the financial years 2018-2019, 2019-2020 and 2020-2021.
Observations:

- Shakaskraal is the only intake point with an additional monthly service charge – to be queried with Eskom
- No check meters in place, placing sole reliance on accuracy of Eskom metering.
- Eskom generally paid on time, avoiding interest and penalties for late payment.

NERSA D forms
Analysis was done on the D forms for the financial years 2018-2019, 2019-2020 and 2020-2021.
Observations:

- Total losses just about double the NERSA benchmark of 11% and constantly climbing.
- An average of 8.5% was used for total losses.
- Non-technical losses are then at percentages where total losses should be.
- If benchmark of 11% can be achieved, KDM would have earned a potential additional R 116m of revenue from electricity for the 2020-2021 financial year.

5.1.4 General Assessment of Metering & Meter Reading for Large Power Users (LPU)

Observations summary:

- Not all LPU customers are on AMR.
- No data verification process / system in place to verify AMR data accuracy before imprting into financial system.
- Data inaccuracies in the AMR data and / or financial system, indicating a data deep dive analysis and clean-up to ensure data in the AMR system and the financial system mirrors each other.

5.1.5 Roles & Responsibilities

Electricity Provision

The provision of electrical services has been assessed using the current organogram which indicates the current structure and available staffing. The department seems well structured, there is however a need to expand and fill vacant positions such as artisans. There is currently a shortage of staff to conduct preventative maintenance which impacts the reliability of the system. There are three key branches that have not been developed within the current structure and this is the Network Control & Support, Protection Telecontrol & Metering and Projects & Assets branch. KDM have proactively identified the need for this expansion and included in their proposed organograms with an expectation to implement over the next two-three financial years.

Billing & Revenue

With respect to meter readings, it can be noted that the current structure indicates several vacancies available which is a cause for concern. The lack of key staff within the billing department is expected to impact the overall value chain and needs to be addressed. Similar can be noted for the credit control section with vacancies available for clerks, controllers, and operators.

5.1.6 Policies, Tarif Setting, Asset Management Planning, and Budgets for Maintenance

Bylaws and Policies

KDM currently have the greater extent of required Bylaws and policies in place to address and guide Asset Management, Indigent requirements, Tariff procedures and principles, credit control and debt collection.

Tariff Setting

The Tariff setting is aligned to the Tariff Policy, Municipal Systems Act and NERSA Tariff guidelines. The tariff determination process is reviewed during the preparation of the annual budget in accordance with the Tariff policy and the goal where possible is to provide a cost-reflective service charge. The current methodology for tariff increases is expected to align to the current policy and principles however the methodology for the current Tariff setting is not documented. A progress report compiled for EXCO on Energy Losses Reduction noted that according to municipal officials there may be a disparity between the bulk cost of electricity and the set tariffs which the municipality charge to their customers, leading to revenue losses. This statement alludes to the fact that there is a need for a comprehensive tariff study.

Asset Management & Planning

KDM is a category B municipality and is coming off a low asset management practice. There is relatively low asset management practice maturity, especially in the field of physical asset management within the utility. These poor asset management practices are often related to skill challenges and constrained budgets. As part of the Vuthela LED project, IMQS established a high-level Asset Management Plan (AMP). This AMP is a high-level initial document to start steering the municipality towards implementing quality asset management planning. The Electrical Engineering Services department has compiled a draft Electricity Asset Management System document that is a planned system to be implemented for electrical infrastructure. This plan is expected to overcome the current status of 80% corrective maintenance and 20% preventative maintenance to 20% corrective maintenance and 80% preventative maintenance.

Budget for Operations & Maintenance
KDM have been proactive in identifying its repairs and maintenance needs as well as capital projects with support from the associated master planning assessments. They have approved council budgets over the current and next two financial years for repairs and maintenance which equates to around R30 million per financial year. The actual expense for the year is however much greater and shown in Table 16 of this report. The total expense for the last financial year was R903 million with electricity purchase at R767 million. It can be noted that when comparing the repairs and maintenance spend to revenue from sales of electricity, the repairs and maintenance spend falls within 3% for 2020/2021 financial year.

5.1.7 Technical Management Information Systems

There is a general lack of information systems to support electricity service delivery, maintenance and asset management. The business unit has identified several gaps in relation to service provision with one of these being information management systems. The current systems still incorporate paper-based processes with a need for automated processes. The following information systems have been identified,

ESRI ArcGIS Software: KDM utilise ArcGIS within their planning and development department. The software is fully licensed with a maintenance plan and website interface, this software package is not linked to any other systems.

Munsoft: KDM utilise Munsoft for financial management and billing, fleet services as well as host and update their asset register. Munsoft is a versatile tool that provides the utilities current requirements and is mSCAO compliant. Munsoft does not have any interfaces to other systems currently.

Sage VIP Premier: KDM utilise Sage for payroll which is independent to Munsoft with no interface.
Microsoft: Excel, Projects etc. are used on a day-to-day basis, also typically used for asset planning and creation then transferred to Munsoft.

On Key: KDM utilise On Key Maintenance management system for electrical assets. The project was implemented, however not fully successful as it is currently not being utilised fully. This system currently has no interfaces to other systems.

SCADA: SCADA functionality currently does not exist in KDM, a project has however been initiated at substation level and has gone out for tender. Implementation is expected to be complete in the next financial year.

Asset Management Information Systems (AMIS): A study has been conducted as part of the Vuthela iLembe LED Programme to assess the current utility processes and gap analyses thereof with respect to AMIS. The general requirements for the AMIS and associated components have been unpacked as part of the AMIS study, with a solution roadmap on the proposed way forward. The current understanding is that the recommendations of this study have not yet been implemented.

5.2 Technical Losses

The technical losses within KDM have been historically estimated at 10% with no detailed studies conducted to verify this estimate. In recent years there were two assessments completed and the following can be noted,

1. As part of the 2019 Master Plan Revision, technical losses for the KDM electrical network were estimated using the following approach,

- LV Copper losses were obtained directly from the Reticmaster simulation package designed to NRS 034
- MV Copper losses were obtained by the DiGSILENT PowerFactory software package based on the networks produced for this study.
- The magnetizing losses of the transformers were based on database no-load losses of similar transformers.

The estimated technical losses for the Northern and Southern regions were estimated to be 6% and 8%

2. An estimation of the technical energy losses on the HV/MV networks of KDM were conducted in 2021 by a World Bank Consultant as part of the Vuthela Ilembe LED Support Programme. The following approach was taken to conduct the study,

    - Develop a virtual distribution network that represents the current Urban topology of the 33kV and 11kV system of KDM. This is a typical Eskom 33kV supply to a 33/11kV Distribution substation with three 10MVA transformers and associated 11kV feeders and 11/0.4kV reticulation transformers. The electrical equipment is based on information available within the EMP and parameters are derived from manufacture data sheets.
    - A power profile was developed using 2018/2019 energy consumption and maximum demand data for the purpose of estimating technical power and energy losses.

The estimated technical losses from the virtual network study are equal to 4.92%, it must be noted that this does however exclude the LV network. The estimate of 4.92% was considered under the worst-case scenario and a more realistic estimate would be 4.5%.

A comparison of the two studies indicates that the sample “virtual network” has higher technical losses in the range of 1.5%, with the EMP study indicating a 3% loss and the sample network analysis concluding the technical loss estimation at 4.5% on the MV Distribution networks. The estimate of LV losses is in the range of 4% which is considered a fair estimate when compared to similar utilities. The total technical loss is therefore estimated at **8.5%** based on the analysis conducted to date.

5.3 Non-Technical Losses

5.3.1 Assess completeness & adequacy of metering of electricity - various categories of users

A data dump was obtained from Munsoft. Refer section 4.3.3.1 on dteai regarding information received and the process to structure the data for analysis:

Finding:

- A lot of tariff descriptions are being used which seemingly does not link back to a tariff structure.
- Errors could be seen between the type of account and the tariff type. Commercial and domestic account types are for example linked to streetlight tariffs.
- A large number of stands (29681) have no tariff, nor account type description.
- Large need identified for data cleansing.

5.3.2 Assess adequacy, efficiency of institutional arrangements for meter installations & readings

SOPs for the following were found to exist:

- SOPB003 – Meter movement
- SOPB0006 – Meter reading
- SOPB004 – Prepaid

Room for improvement was noted, specifically changing to a process flow type SOP with “Swim lanes” outlining responsible stakeholders and their respective responsibilities, linked a possible SLA (Service Level agreement)

5.3.3 Assess adequacy, effectiveness & efficiency of financial systems

Financial systems in use consist of:

- Main Financial management system
    - MUNSOFT system is in use
    - System is mSCOA compliant
        - Supplementary systems
    - Conlog Prepaid vending system
        - System is STS compliant
        - No interface between MUNSOFT and Contour Technology systems
        - No data mirroring of the two systems
    - AMR system
        - No data mirroring between the two system

A supplementary supporting data management system to considered to ensure data integrity within main system.

5.3.4 Assess integrity, completeness & accuracy of energy customer data base

Cadastral data, the 2021 valuation roll and a Munsoft customer data dump was received and compared.

Aspects assessed indicted:

- Cadastral data indicates 34 438 registered stands.
- Some duplication of 6 stands in cadastral data to be investigated.
- Valuation roll and customer data base have considerably more stands in its records.
- Some stands have incorrect length SG code – should be 21 digits
- Some stands have the same SG code.
- 4409 stands have multiple prepaid meters linked to it.

Anomalies in valuation roll and comparative data from valuation roll and customer data base suggest a further data cleansing exercise.

KDM to also consider a different strategy on multiple meters linked to a specific stand.

5.3.5 Review report on Customer Relations Management System and / or Information Systems

Reports by ZTE Consulting reviewed in this regard:

- Vuthela CRM technical feasibility report dated 30 June 2020.
- Strategic plan for the iLembe Regional Customer Care centre dated 19 June 2020

KDM currently have a control room that is manned 24/7 and operated in shifts. They utilise a three-shift system and are currently short staffed with no supervisor. The KDM control has two key functions,

- Attendance to consumer queries through WhatsApp, Facebook page, and walk ins. The current phone system is a standard office telephone with no switchboard and all calls are logged on a Web-based system that forms part of CMMS.
- Dispatching of field resources, standby staff are notified through control for afterhours work.

Reports recommend a single platform Customer Care system for whole of iLembe. Our views support this recommendation.

5.3.6 Assess billing & revenue collection re electrical services provision

Assessment of 12-month conventional billing history and 12-month prepaid purchases history was conducted:

- As of September 2021, 52% of conventional customers were interim billed. A benchmark of 90% actual readings onto bill should be achieved. Reasons for interim billing could be any or a combination of below factors:
    - Tampered meters
    - Faulty meters
    - Problems getting access to meters
    - Meters on system but not in the field
- On average 54% of prepaid customers did not buy electricity during the financial year reviewed. Average was calculated by taking the number of meters showing zero purchases per month, averaging it out over the year and calculating that average value as % of total prepaid customers.
- 42% have not bought for the entire year reviewed.
- Prepaid meters also do not reflect in the financial system

Strategies to improve revenue from energy charges will have to include ensuring meters are read regularly and prepaid customers are buying, further supporting a data management system and processes to support such strategies.

5.3.7 Investigate necessity of tariff study and review

- No tariff study has been done in the last 5 years
- A tariff study and review are recommended.

5.3.8 Review completed Indigent register study

A report by Bonakude Consulting (Pty) Ltd titled “Alignment of Indigent policies, Uniform systems and processes for maintaining the indigent register across municipalities” was reviewed for this aspect. This 2020 report forms part of the Vuthela iLembe LED support program.

Existing systems and processes were found to have “gaps”.

The establishment of a centralised repository for indigent management, that is web and cloud based, is secure and have audit trail functionality, was recommended by the report and is supported by this consultant’s analysis.

5.3.9 Review of Debt management

A debtor's age report as of June 2022 was received and analysed.

- Total debtors' book over R 890m.
- 55% older than 180 days
- 77% older than 90 days
- Biggest debtor by category user is domestic customers
- Of the top 25 debtors, 21 are domestic customers. Judging by the customer names though, it seems that at least 11 are incorrectly flagged as domestic, whereas they should be commercial.
- 68% of debtors book not linked to any customer type.

5.3.10 Conclusion

Data management and ensuring quality and integrity of data is a common thread throughout the non-technical losses assessment. None of the current systems can do data verification and ensuring integrity as they are not designed for this purpose. A separate supplementary and supporting system is needed for this.

5.4 Community / End-user Awareness Communication & Campaigns

No current campaigns / processes exist to educate community on importance of paying for services and danger of electricity theft.

ANNEXURE 1

KDM 33kV & 11kV Single Line Diagrams

ESKOM STANGER 132/33 kV
SUBSTATION
OPERATING DIAGRAM
DD/1737 rev 7

BUSBAR 2
FB2

BUSBAR 1
FB1

CUSTOMER EQUIPMENT
NMD 40 00-kVA

KWADUKUZA 33 kV
POINT OF SUPPLY
KDM-3001-DD-00

Busbar 2

Busbar 1

CAP BANK

N/O

POPLAR - 1 300m

95mm² XLPE
100m

GLEDHOW
33/11kV
SUBSTATION
KDM-4004-DD-00

NOT ON
SITE

NOT
CONNECTED

95mm² XLPE
60m

OAK - 1 400m

95mm² XLPE
300m

95mm² XLPE
100m

POPLAR - 3 220m

POPLAR - 3 220m

POPLAR - 3 220m

POPLAR - 3 000m

OAK

SAPPI
33/11kV
SUBSTATION
KDM-4002-DD-00

N/O

Busbar 3

Busbar 2

Busbar 1

2x95mm²
300m

GLENHILLS
33/11kV
SUBSTATION
KDM-4003-DD-00

LINE TO
SHAKASKRAAL
33kV SUBSTATION
RUNNING AT 11kV

150mm² XLPE - 2200m

POPLAR - 1500m

95mm² XLPE

3x300mm²
(Single Core XLPE)
1 130m

LAVOIPIERRE
33/11kV
SUBSTATION
KDM-4001-DD-00

Busbar 2

Busbar 1

80m

20m

N/O

GROUTVILLE
33/11kV
SUBSTATION
KDM-4013-DD-00

95mm² XLPE - 2200m

95mm² XLPE - 2200m

INDUSTRIAL
33/11kV
SUBSTATION
KDM-4005-DD-00

N/O

Busbar 2

Busbar 1

LEGEND

	95MM CABLE
	300MM CABLE
	150MM CABLE
	OAK CONDUCTOR
	POPLAR CONDUCTOR

CLIENT

KWADUKUZA
MUNICIPALITY

APPROVED BY	SIGNATURE

DATE

REV	DATE	REVISION DETAILS	APPROVED

PROJECT

108018

TITLE

33kV SINGLE LINE
DIAGRAM
(NORTHERN NETWORK)

CONSULTANT

aurecon
éThekwini
4 - 10 School Road,
Park Row Building,
Pinetown
Tel: +27 31 714 2500
P.O.Box 932,
Pinetown,
3600
Fax: +27 31 702 0287

DRAWN	DESIGNED	
D NAICKER	D NAICKER	

CHECKED	PROJECT No.
P SEEBRAN	

APPROVED	SCALE	SIZE
M VENTER	NTS	A3L

	DRAWING No.	REV
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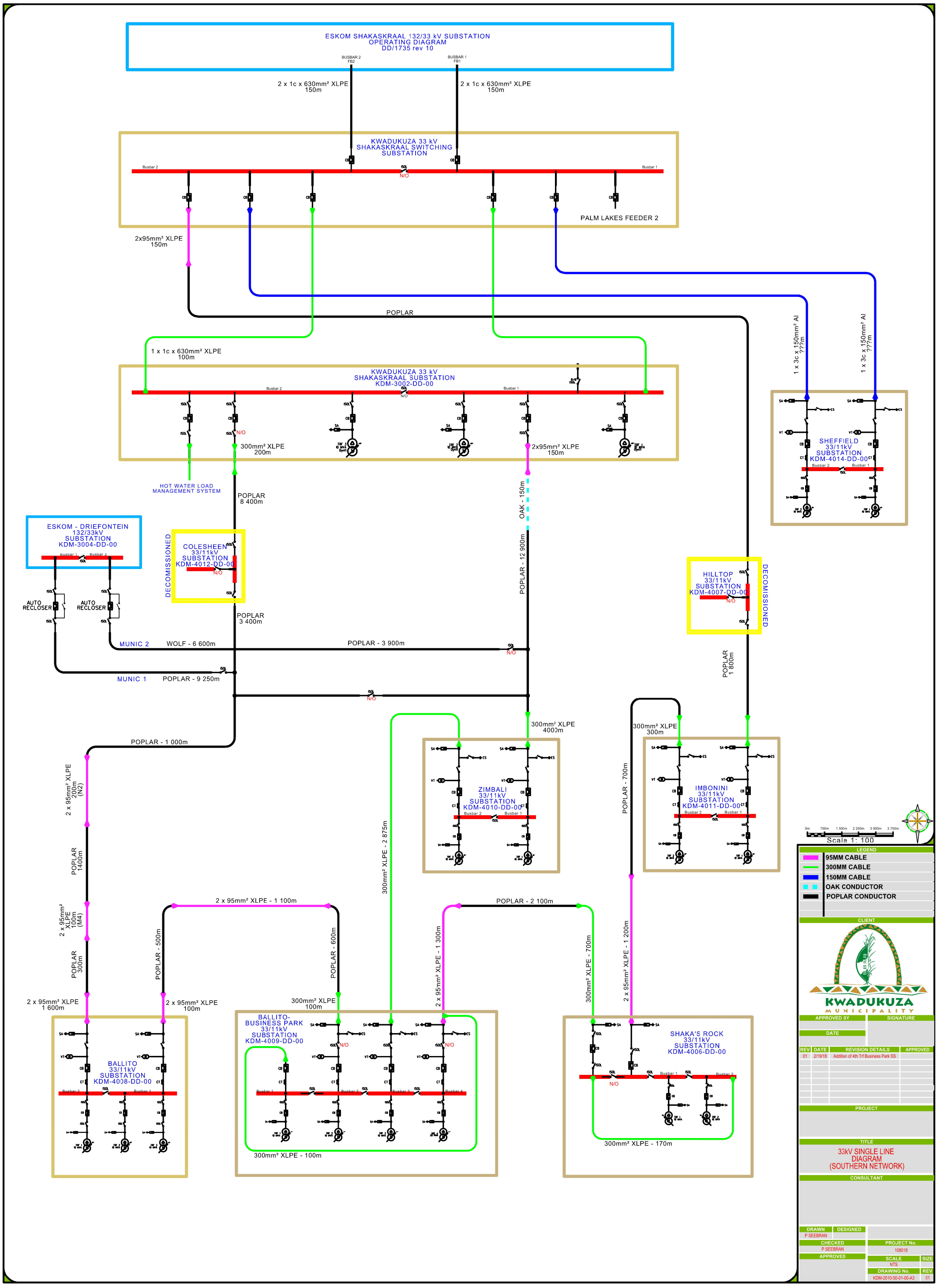
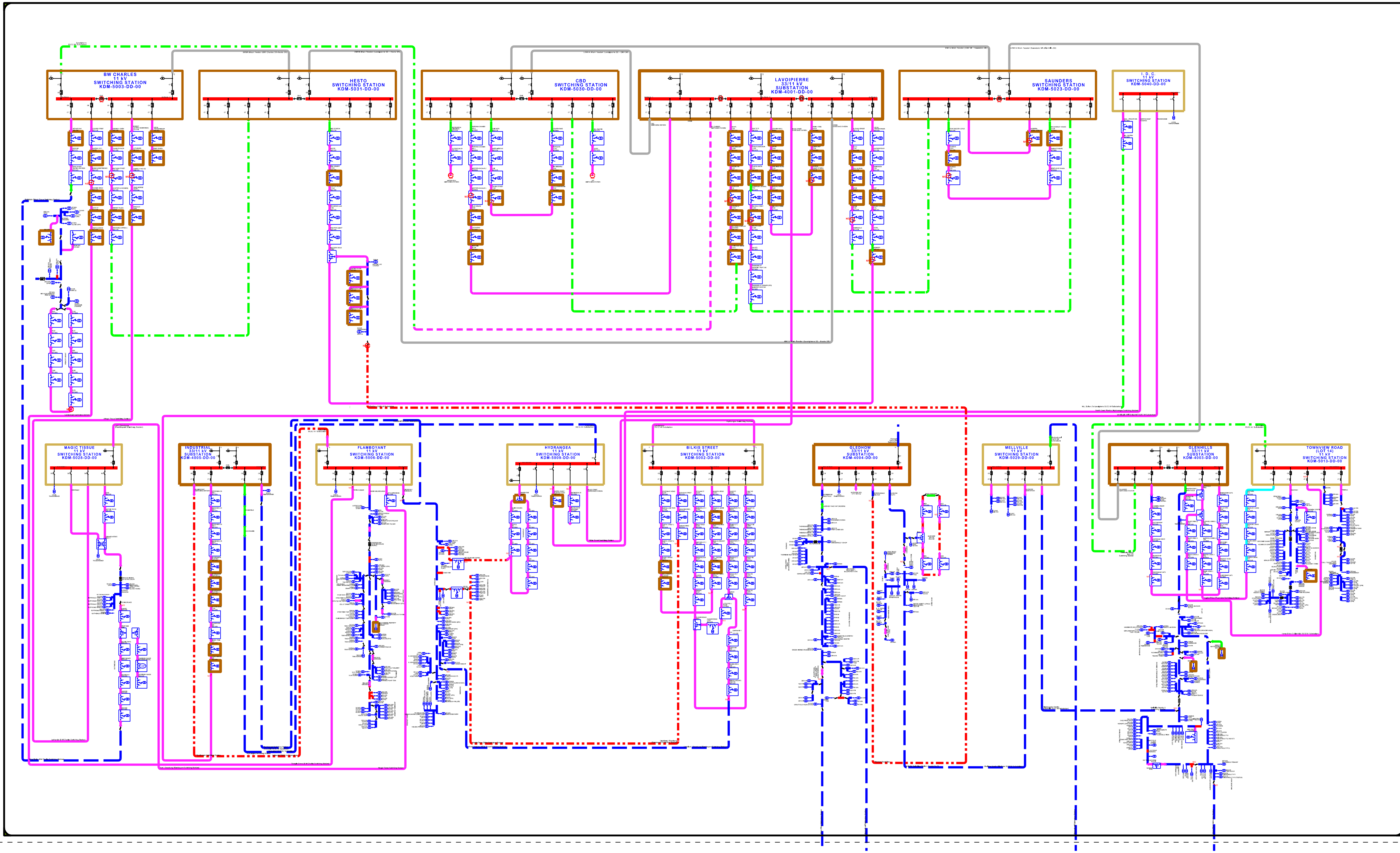

ESKOM SHAKASKRAAL 132/33 kV SUBSTATION
OPERATING DIAGRAM
DD/1735 rev 10
BUSBAR 2
FB2
BUSBAR 1
FB1
2 x 1c x 630mm² XLPE
150m
2 x 1c x 630mm² XLPE
150m
KWADUKUZA 33 kV
SHAKASKRAAL SWITCHING
SUBSTATION
Busbar 2
Busbar 1
N/O
PALM LAKES FEEDER 2
2x95mm² XLPE
150m
POPLAR
1 x 1c x 630mm² XLPE
100m
KWADUKUZA 33 kV
SHAKASKRAAL SUBSTATION
KDM-3002-DD-00
300mm² XLPE
200m
2x95mm² XLPE
150m
HOT WATER LOAD
MANAGEMENT SYSTEM
POPLAR
8 400m
OAK - 150m
POPLAR - 12 900m
1 x 3c x 150mm² Al
???m
1 x 3c x 150mm² Al
???m
SHEFFIELD
33/11kV
SUBSTATION
KDM-4014-DD-00
ESKOM - DRIEFONTEIN
132/33kV
SUBSTATION
KDM-3004-DD-00
AUTO
RECLOSER
AUTO
RECLOSER
DECOMISSIONED
COLESHEEN
33/11kV
SUBSTATION
KDM-4012-DD-00
POPLAR
3 400m
MUNIC 2
WOLF - 6 600m
POPLAR - 3 900m
MUNIC 1
POPLAR - 9 250m
HILLTOP
33/11kV
SUBSTATION
KDM-4007-DD-00
DECOMISSIONED
POPLAR
1 800m
POPLAR - 1 000m
300mm² XLPE
400m
ZIMBALI
33/11kV
SUBSTATION
KDM-4010-DD-00
300mm² XLPE
300m
POPLAR - 700m
IMBONINI
33/11kV
SUBSTATION
KDM-4011-DD-00
2 x 95mm² XLPE
200m
(N2)
POPLAR
1400m
300mm² XLPE - 2 875m
2 x 95mm² XLPE - 1 100m
POPLAR - 2 100m
2 x 95mm²
XLPE
100m
(M4)
POPLAR
300m
POPLAR - 500m
POPLAR - 600m
2 x 95mm² XLPE - 1 300m
300mm² XLPE - 700m
2 x 95mm² XLPE - 1 200m
2 x 95mm² XLPE
1 600m
2 x 95mm² XLPE
100m
300mm² XLPE
100m
BALLITO
33/11kV
SUBSTATION
KDM-4008-DD-00
BALLITO-
BUSINESS PARK
33/11kV
SUBSTATION
KDM-4009-DD-00
300mm² XLPE - 100m
SHAKA'S ROCK
33/11kV
SUBSTATION
KDM-4006-DD-00
300mm² XLPE - 170m
Scale 1: 100
LEGEND
95MM CABLE
300MM CABLE
150MM CABLE
OAK CONDUCTOR
POPLAR CONDUCTOR
CLIENT
KWADUKUZA
MUNICIPALITY
APPROVED BY
SIGNATURE
DATE
REV
DATE
REVISION DETAILS
APPROVED
01
2/19/18
Addition of 4th Trf Business Park SS
PROJECT
TITLE
33kV SINGLE LINE
DIAGRAM
(SOUTHERN NETWORK)
CONSULTANT
DRAWN
P SEEBRAN
DESIGNED
CHECKED
P SEEBRAN
APPROVED
PROJECT No.
108018
SCALE
NTS
SIZE
DRAWING No.
KDM-2010-50-01-00-A3
REV
01



OVERHEAD LINE (OAK)
OVERHEAD LINE (35mm² ABC)
OVERHEAD LINE (70mm² ABC)
OVERHEAD LINE (95mm² ABC)

NOTES

CLIENT

KWADUKUZA MUNICIPALITY

APPROVED BY	SIGNATURE
DATE	

REV	DATE	REVISION DETAILS	APPROVED
01	12/10/13	UPDATED VIA SITE INSPECTION	
02	25/05/16	UPDATED VIA SITE INSPECTION	

PROJECT

KDM 33 & 11 kV Protection Grading

TITLE

NORTHERN 11 kV NETWORK DIAGRAM

CONSULTANT

aurecon éThekwini

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P.O.Box 932, Pinetown, 3600
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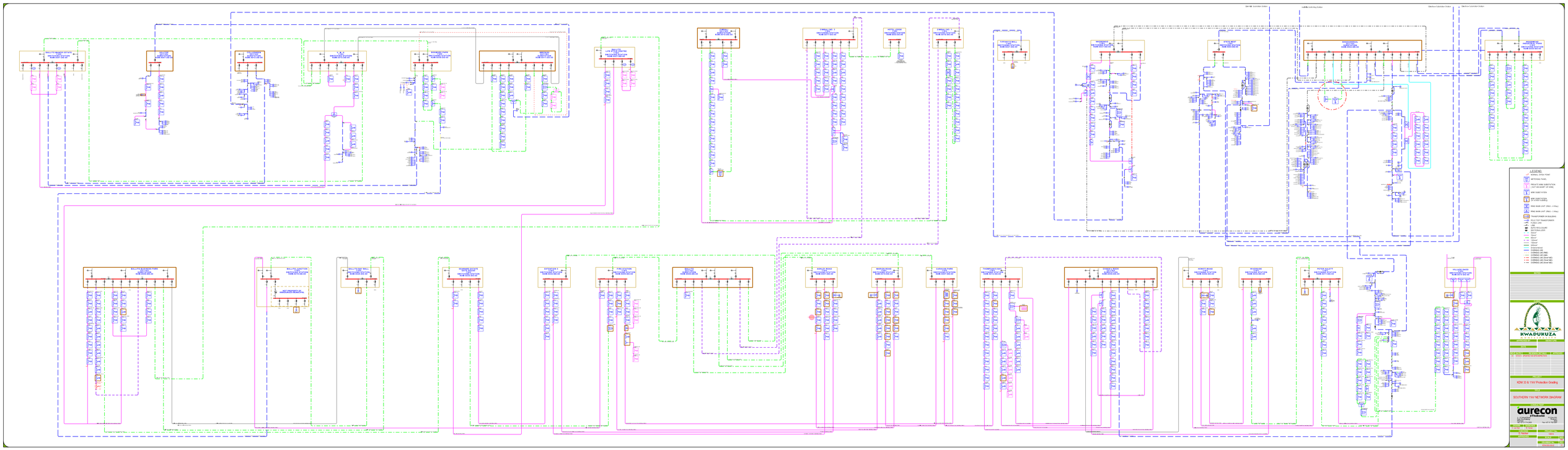
CHECKED		PROJECT No.
D. Naicker		108018
APPROVED		SCALE / SIZE: A0L
		DRAWING No.: KDM-2030-50-02 / REV: 02



LEGEND

N/O NORMAL OPEN POINT
METERING PANEL
PRIVATE MINI SUBSTATION [NOT AN ASSET OF KDM]
MINI SUBSTATION
MINI SUBSTATION (In a brick building)
RING MAIN UNIT (RMU - 4 Way)
RING MAIN UNIT (RMU - 3 Way)
TRANSFORMER IN BUILDING
POLE TOP TRANSFORMER
FUSED LINK
LINK
AUTO RECLOSURE
SECTIONALIZER
35mm²
70mm²
95mm²
120mm²
150mm²
240mm²
Undetermined
OVERHEAD LINE
OVERHEAD LINE (PINE)
OVERHEAD LINE (OAK)
OVERHEAD LINE (35mm² ABC)
OVERHEAD LINE (70mm² ABC)
OVERHEAD LINE (95mm² ABC)

NOTES

CLIENT

KWADUKUZA
MUNICIPALITY

APPROVED BY	SIGNATURE
DATE	

REV	DATE	REVISION DETAILS	APPROVED
01	12/10/13	UPDATED VIA SITE INSPECTION	

PROJECT

KDM 33 & 11kV Protection Grading

TITLE

SOUTHERN 11kV NETWORK DIAGRAM

CONSULTANT

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4 - 10 School Road,
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3600
Fax: +27 31 702 0287

DRAWN	DESIGNED
C. van Dyk	M. Venter

CHECKED	PROJECT No.
D. Naicker	108018

APPROVED	SCALE	SIZE
		A0L
	DRAWING No.	REV
	KDM-2030-50-02	01

ANNEXURE 2

Eskom Billing Summary

Stanger intake point Eskom billing summary (3 years)

Intake Point		Stanger												
Premise ID		5433388634												
		Month												Totals / *Averages*
		Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	
Month Days		31	31	30	31	30	31	31	28	31	30	31	30	
Notified Max Demand		65,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	*74,167*
Utilized Capacity		65,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	*74,167*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		13,423,040.76	13,093,006.64										12,635,916.42	**39,151,963.82**
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				13,859,014.30	12,835,579.82	12,661,000.36	15,843,758.30	13,588,877.64	12,445,120.44	14,494,918.46	13,778,849.72	13,611,433.64		**123,118,552.68**
HIGH SEASON ENERGY CONSUMPTION STD kWh		12,115,758.06	12,486,642.74										10,569,165.00	**35,171,565.80**
LOW SEASON ENERGY CONSUMPTION STD kWh				11,182,958.28	12,801,123.76	12,255,643.26	10,785,379.96	12,366,690.92	11,309,054.42	11,698,930.60	11,198,153.92	12,425,463.94		**106,023,399.06**
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		5,356,710.02	5,372,433.48										4,295,851.96	**15,024,995.46**
LOW SEASON ENERGY CONSUMPTION PEAK kWh				4,450,518.94	5,481,124.32	5,209,692.28	4,179,382.60	5,059,513.70	4,626,582.90	4,791,933.34	4,642,242.32	4,915,812.48		**43,356,802.88**
ENERGY CONSUMPTION ALL kWh		30,895,508.84	30,952,082.86	29,492,491.52	31,117,827.90	30,126,335.90	30,808,520.86	31,015,082.26	28,380,757.76	30,985,782.40	29,619,245.96	30,952,710.06	27,500,933.38	**361,847,279.70**
DEMAND CONSUMPTION - OFF PEAK		57,367.84	57,941.88	56,301.80	55,748.60	54,866.90	53,815.28	56,916.91	62,577.59	58,005.54	56,320.63	57,566.43	57,028.51	**684,457.91**
SEASON DEMAND CONSUMPTION - STD		56,878.70	57,084.29	56,640.68	56,811.62	57,422.57	58,739.20	56,231.70	57,681.04	58,696.48	58,289.97	60,754.88	55,846.79	**691,077.92**
DEMAND CONSUMPTION - PEAK		62,134.60	61,133.56	60,397.14	61,072.44	60,390.49	59,356.79	56,753.38	64,466.80	59,893.55	60,215.72	60,333.02	60,984.59	**727,132.08**
DEMAND READING - KW/KVA		62,134.60	61,133.56	60,397.14	61,072.44	60,390.49	59,356.79	56,916.91	64,466.80	59,893.55	60,215.72	60,754.88	60,984.59	**727,717.47**
REACTIVE ENERGY - OFF PEAK		4,951,561.44	4,471,007.04	5,432,585.28	5,002,436.64	5,231,722.08	6,277,080.48	5,295,010.56	4,999,754.88	5,711,952.00	5,807,919.84	5,553,759.84	4,627,777.44	**63,362,567.52**
REACTIVE ENERGY - STD		4,172,328.00	4,251,154.08	4,124,783.52	4,731,353.76	4,659,178.08	4,028,469.12	4,643,447.42	4,340,221.38	4,378,772.16	4,269,745.44	4,613,640.00	3,673,058.88	**51,886,151.84**
REACTIVE ENERGY - PEAK		1,646,251.88	1,642,862.88	1,520,055.84	1,937,155.20	1,878,822.72	1,507,231.68	1,843,183.76	1,705,391.52	1,729,566.24	1,695,903.36	1,735,034.88	1,340,133.12	**20,181,593.08**
EXCESS REACTIVE ENERGY		620,282.75	582,187.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	665,252.30	**1,867,722.33**
LOAD FACTOR		69.00	70.00	71.00	72.00	75.00	73.00	77.00	68.00	73.00	71.00	72.00	65.00	***71.33333333***
CHARGES DETAILS														
Administration Charge per day for monthdays	R 119.2000	R 3,695.20	R 3,695.20	R 3,576.00	R 3,695.20	R 3,576.00	R 3,695.20	R 3,695.20	R 3,337.60	R 3,695.20	R 3,576.00	R 3,695.20	R 3,576.00	R **43,508.00**
TX Network Capacity Charge ?kVA	R 7.7100	R 501,150.00	R 578,250.00	R 578,250.00	R 578,250.00	R 578,250.00	R 578,250.00	R 578,250.00	R 578,250.00	R 578,250.00	R 578,250.00	R 578,250.00	R 578,250.00	R **6,861,900.00**
Network Capacity Charge /kVA	R 15.2900	R 993,850.00	R 1,146,750.00	R 1,146,750.00	R 1,146,750.00	R 1,146,750.00	R 1,146,750.00	R 1,146,750.00	R 1,146,750.00	R 1,146,750.00	R 1,146,750.00	R 1,146,750.00	R 1,146,750.00	R **13,608,100.00**
Excess Network Capacity Charge 8,776.23 kVa @ R26.60	R 26.6000													
Network Demand Charge /kVA	R 28.9900	R 1,801,282.05	R 1,772,261.90	R 1,750,913.09	R 1,770,490.04	R 1,750,720.31	R 1,720,753.34	R 1,650,021.22	R 1,868,892.53	R 1,736,314.01	R 1,745,653.72	R 1,761,283.97	R 1,767,943.26	R **21,096,529.46**
Ancillary Service Charge /kWh	R 0.0038	R 117,402.93	R 117,617.92	R 112,071.47	R 118,247.75	R 114,480.08	R 117,072.38	R 117,857.31	R 107,846.88	R 117,745.97	R 112,553.13	R 117,620.30	R 104,503.55	R **1,375,019.66**
High Season Off Peak Energy Charge /kWh	R 0.4909	R 6,589,370.83	R 6,427,357.14	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 6,202,971.16	R **19,219,699.13**
Low Season Off Peak Energy Charge /kWh	R 0.4250	R -	R -	R 5,890,080.95	R 5,455,121.50	R 5,380,925.00	R 6,733,597.15	R 5,775,273.15	R 5,289,176.00	R 6,160,340.15	R 5,856,011.25	R 5,784,859.45	R -	R **52,325,384.60**
High Season Standard Energy Charge /kWh	R 0.9040	R 10,952,645.23	R 11,287,925.27	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 9,554,525.16	R **31,795,095.66**
Low Season Standard Energy Charge /kWh	R 0.6700	R -	R -	R 7,492,581.86	R 8,576,753.08	R 8,211,280.81	R 7,226,204.60	R 8,285,682.97	R 7,577,066.18	R 7,838,283.77	R 7,502,763.18	R 8,325,060.88	R -	R **71,035,677.33**
High Season Peak Energy Charge / kWh	R 2.9840	R 15,984,422.64	R 16,031,340.07	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 12,818,822.37	R **44,834,585.08**
Low Season Peak Energy Charge / kWh	R 0.9735	R -	R -	R 4,332,580.25	R 5,335,874.21	R 5,071,635.16	R 4,068,629.35	R 4,925,436.88	R 4,503,978.55	R 4,664,946.78	R 4,519,222.59	R 4,785,542.98	R -	R **42,207,846.75**
Electrification and Rural Subsidy /kWh	R 0.0742	R 2,292,446.77	R 2,296,644.56	R 2,188,342.91	R 2,308,942.84	R 2,235,374.13	R 2,285,992.26	R 2,301,319.08	R 2,105,852.24	R 2,299,145.02	R 2,197,748.05	R 2,296,691.08	R 2,040,569.23	R **26,849,068.18**
High Season Reactive energy Charge /kvarh	R 0.1340	R 83,117.92	R 78,013.06	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 89,143.77	R **250,274.75**
Total Charges		**R 39,319,383.58**	**R 39,739,855.12**	**R 23,495,146.52**	**R 25,294,124.61**	**R 24,492,991.49**	**R 23,880,944.28**	**R 24,784,285.82**	**R 23,181,149.99**	**R 24,545,470.91**	**R 23,662,527.93**	**R 24,799,753.86**	**R 34,307,054.50**	R **331,502,688.59**
Consumption Charges		R 33,526,438.70	R 33,746,622.48	R 17,715,243.06	R 19,367,748.79	R 18,663,840.97	R 18,028,431.10	R 18,986,393.00	R 17,370,220.73	R 18,663,570.70	R 17,877,997.02	R 18,895,463.31	R 28,576,318.69	R **261,418,288.55**
Ancillary Charges		R 5,792,944.88	R 5,993,232.64	R 5,779,903.46	R 5,926,375.82	R 5,829,150.51	R 5,852,513.18	R 5,797,892.82	R 5,810,929.26	R 5,881,900.21	R 5,784,530.91	R 5,904,290.55	R 5,730,735.81	R **70,084,400.04**
Consumption Charges as % of Total Charges		85.27%	84.92%	75.40%	76.57%	76.20%	75.49%	76.61%	74.93%	76.04%	75.55%	76.19%	83.30%	**78.04%**
Ancillary Charges as % of Total Charges		14.73%	15.08%	24.60%	23.43%	23.80%	24.51%	23.39%	25.07%	23.96%	24.45%	23.81%	16.70%	**21.96%**

Intake Point		Stanger												
Premise ID		5433388634												
		Month												Totals / *Averages*
		Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	
Month Days		31	31	30	31	30	31	31	29	31	30	31	30	
Notified Max Demand		75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	*75,000*
Utilized Capacity		75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	*75,000*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		12,721,054.12	13,577,628.92										12,863,069.28	**39,161,752.32**
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				13,362,945.30	12,641,437.26	13,304,290.08	15,436,915.20	13,758,640.80	12,306,957.12	13,629,527.04	11,666,693.76	11,609,950.08		**117,717,356.64**
HIGH SEASON ENERGY CONSUMPTION STD kWh		12,509,584.76	12,372,006.90										12,414,419.52	**37,296,011.18**
LOW SEASON ENERGY CONSUMPTION STD kWh				11,610,700.00	12,383,710.88	12,486,643.68	11,085,582.72	12,302,817.60	11,085,507.12	11,953,599.84	9,220,687.68	10,158,937.92		**102,288,187.44**
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		5,631,247.16	5,179,865.54										5,171,957.28	**15,983,069.98**
LOW SEASON ENERGY CONSUMPTION PEAK kWh				4,778,607.38	5,370,889.96	5,007,479.99	4,191,594.24	5,044,247.52	4,485,421.68	5,034,057.12	3,630,331.20	4,022,280.48		**41,564,909.57**
ENERGY CONSUMPTION ALL kWh		30,861,886.04	31,129,501.36	29,752,252.68	30,396,038.10	30,798,413.75	30,714,092.16	31,105,705.92	27,877,885.92	30,617,184.00	24,517,712.64	25,791,168.48	30,449,446.08	**354,011,287.13**
DEMAND CONSUMPTION - OFF PEAK		58,434.72	57,032.04	56,765.73	55,880.58	54,630.71	54,049.49	58,901.92	59,672.27	56,168.93	55,885.46	57,607.08	60,987.11	**686,016.04**
SEASON DEMAND CONSUMPTION - STD		58,739.79	56,724.29	61,146.61	55,998.75	60,908.01	58,147.19	56,436.01	61,014.69	58,187.51	53,777.43	60,364.93	61,648.10	**703,093.31**
DEMAND CONSUMPTION - PEAK		61,620.64	62,006.53	62,198.70	58,570.08	60,406.12	62,150.45	60,983.51	58,291.08	64,833.05	53,883.87	59,324.45	64,395.51	**728,663.99**
DEMAND READING - KW/KVA		61,620.64	62,006.53	62,198.70	58,570.08	60,908.01	62,150.35	60,983.51	61,014.69	64,833.05	55,885.46	60,364.93	64,395.51	**734,931.46**
REACTIVE ENERGY - OFF PEAK		4,790,241.12	5,168,725.92	5,896,507.20	4,251,419.03	4,724,361.59	5,487,696.48	5,110,010.88	4,605,960.00	4,847,805.60	4,193,470.56	4,090,809.60	3,908,286.72	**57,075,294.70**
REACTIVE ENERGY - STD		4,426,742.40	4,341,801.60	4,681,585.92	3,942,279.35	4,278,361.59	3,697,071.36	4,420,332.00	3,985,822.08	4,037,495.52	3,038,401.44	3,210,824.64	3,479,445.12	**47,540,163.02**
REACTIVE ENERGY - PEAK		1,763,144.64	1,628,635.68	1,834,151.52	1,628,880.00	1,659,815.99	1,351,651.20	1,746,130.56	1,573,962.72	1,613,785.92	1,173,697.44	1,195,984.32	1,319,506.08	**18,489,346.07**
EXCESS REACTIVE ENERGY		783,044.41	728,510.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53,444.11	**1,564,998.89**
LOAD FACTOR		70.00	70.00	70.00	72.00	73.00	69.00	71.00	68.00	65.00	63.00	58.00	67.00	*68*
CHARGES DETAILS														
Administration Charge per day for monthdays	R 137.8300	R 4,272.73	R 4,272.73	R 4,134.90	R 4,272.73	R 4,134.90	R 4,272.73	R 4,272.73	R 3,997.07	R 4,272.73	R 4,134.90	R 4,272.73	R 4,134.90	R **50,445.78**
TX Network Capacity Charge ?kVA	R 8.9200	R 669,000.00	R 669,000.00	R 669,000.00	R 669,000.00	R 669,000.00	R 669,000.00	R 669,000.00	R 669,000.00	R 669,000.00	R 669,000.00	R 669,000.00	R 669,000.00	R **8,028,000.00**
Network Capacity Charge /kVA	R 17.6800	R 1,326,000.00	R 1,326,000.00	R 1,326,000.00	R 1,326,000.00	R 1,326,000.00	R 1,326,000.00	R 1,326,000.00	R 1,326,000.00	R 1,326,000.00	R 1,326,000.00	R 1,326,000.00	R 1,326,000.00	R **15,912,000.00**
Excess Network Capacity Charge 8,776.23 kVa @ R26.60	R 26.6000													
Network Demand Charge /kVA	R 33.5200	R 2,065,523.85	R 2,078,458.89	R 2,084,900.42	R 1,963,269.08	R 2,041,636.50	R 2,083,279.73	R 2,044,167.26	R 2,045,212.41	R 2,173,203.84	R 1,873,280.62	R 2,023,432.45	R 2,158,537.50	R **24,634,902.54**
Ancillary Service Charge /kWh	R 0.0044	R 135,792.30	R 136,969.80	R 130,909.91	R 133,742.57	R 135,513.02	R 135,142.00	R 136,865.11	R 122,662.70	R 134,715.61	R 107,877.94	R 113,481.14	R 133,977.56	R **1,557,649.66**
High Season Off Peak Energy Charge /kWh	R 0.5676	R 7,220,470.25	R 7,706,662.22	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 7,301,077.96	R **22,228,210.44**
Low Season Off Peak Energy Charge /kWh	R 0.4914	R -	R -	R 6,566,551.17	R 6,212,002.14	R 6,537,728.11	R 7,585,700.03	R 6,760,996.19	R 6,047,638.67	R 6,697,549.57	R 5,733,013.43	R 5,705,129.43	R -	R **57,846,308.74**
High Season Standard Energy Charge /kWh	R 1.0453	R 13,076,269.20	R 12,932,458.92	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 12,976,793.23	R **38,985,521.34**
Low Season Standard Energy Charge /kWh	R 0.7747	R -	R -	R 8,994,809.29	R 9,593,660.91	R 9,673,403.11	R 8,588,001.15	R 9,530,993.10	R 8,587,942.27	R 9,260,453.92	R 7,143,266.99	R 7,870,129.27	R -	R **79,242,660.02**
High Season Peak Energy Charge/ kWh	R 3.4504	R 19,430,054.65	R 17,872,609.65	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 17,845,320.43	R **55,147,984.73**
Low Season Peak Energy Charge / kWh	R 1.1257	R -	R -	R 5,379,277.90	R 6,046,010.87	R 5,636,920.24	R 4,718,477.37	R 5,678,309.97	R 5,049,239.55	R 5,666,837.96	R 4,086,663.61	R 4,527,880.60	R -	R **46,789,618.06**
Electrification and Rural Subsidy /kWh	R 0.0858	R 2,647,949.82	R 2,670,911.19	R 2,552,743.31	R 2,607,980.06	R 2,642,503.92	R 2,635,269.09	R 2,668,869.57	R 2,391,922.62	R 2,626,954.39	R 2,103,619.78	R 2,212,882.21	R 2,612,562.47	R **30,374,168.42**
High Season Reactive energy Charge /kvarh	R 0.1549	R 121,293.52	R 112,846.20	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 8,278.48	R **242,418.19**
Total Charges		**R 46,696,626.32**	**R 45,510,189.59**	**R 27,708,326.91**	**R 28,555,938.37**	**R 28,666,839.79**	**R 27,745,142.11**	**R 28,819,473.93**	**R 26,243,615.28**	**R 28,558,988.02**	**R 23,046,857.26**	**R 24,452,207.83**	**R 45,035,682.52**	R **381,039,887.92**
Consumption Charges		R 39,726,794.10	R 38,511,730.78	R 20,940,638.36	R 21,851,673.93	R 21,848,051.45	R 20,892,178.55	R 21,970,299.27	R 19,684,820.49	R 21,624,841.45	R 16,962,944.03	R 18,103,139.29	R 38,123,191.62	R **300,240,303.32**
Ancillary Charges		R 6,969,832.22	R 6,998,458.80	R 6,767,688.54	R 6,704,264.44	R 6,818,788.34	R 6,852,963.56	R 6,849,174.67	R 6,558,794.80	R 6,934,146.56	R 6,083,913.23	R 6,349,068.54	R 6,912,490.90	R **80,799,584.60**
Consumption Charges as % of Total Charges		85.07%	84.62%	75.58%	76.52%	76.21%	75.30%	76.23%	75.01%	75.72%	73.60%	74.08%	84.65%	**77.71%**
Ancillary Charges as % of Total Charges		14.93%	15.38%	24.42%	23.48%	23.79%	24.70%	23.77%	24.99%	24.28%	26.40%	25.97%	15.35%	**22.29%**

Intake Point	Stanger
Premise ID	5433388634

	Month												Totals / *Averages*
	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	
Notified Max Demand	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	*75,000*
Utilized Capacity	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	*75,000*
CONSUMPTION DETAILS													
ENERGY CONSUMPTION OFF PEAK kWH	12,397,639.68	12,314,873.76	12,894,239.52	12,086,374.08	13,376,526.00	14,764,758.24	14,351,078.88	12,195,355.20	13,313,538.72	14,299,260.48	13,456,136.64	13,062,192.48	**158,511,973.68**
ENERGY CONSUMPTION STD kWh	12,962,915.76	10,579,920.00	11,830,046.88	12,062,087.04	11,745,758.88	11,955,607.68	11,391,393.60	11,340,637.44	12,602,118.72	11,144,733.12	11,724,319.20	12,035,288.16	**141,374,826.48**
ENERGY CONSUMPTION PEAK kWh	5,705,367.12	4,348,204.80	5,060,016.00	5,017,932.00	4,888,082.64	4,957,141.92	4,595,602.08	4,574,414.88	5,160,509.28	4,483,237.92	4,880,995.20	5,150,265.60	**58,821,769.44**
ENERGY CONSUMPTION ALL kWh	31,065,922.56	27,242,998.56	29,784,302.40	29,166,393.12	30,010,367.52	31,677,507.84	30,338,074.56	28,110,407.52	31,076,166.72	29,927,231.52	30,061,451.04	30,247,746.24	**358,708,569.60**
DEMAND CONSUMPTION - OFF PEAK	60,014.13	61,462.13	56,310.06	55,909.11	54,415.12	56,611.54	53,488.50	53,753.51	59,200.38	57,398.71	54,983.17	59,098.11	**682,644.47**
DEMAND CONSUMPTION - STD	61,879.61	60,621.48	63,888.63	57,305.63	56,763.25	59,589.18	58,070.02	56,900.30	57,568.23	57,557.58	59,616.63	60,427.03	**710,187.57**
DEMAND CONSUMPTION - PEAK	65,801.88	64,587.26	66,775.44	59,771.26	58,384.64	60,125.91	56,488.32	58,144.41	62,504.49	58,974.92	59,610.49	63,647.26	**734,816.28**
DEMAND READING - KW/KVA	65,801.89	64,587.27	66,775.44	59,771.27	58,384.65	60,125.91	58,070.03	58,144.42	62,504.50	58,974.93	59,616.63	63,647.27	**736,404.21**
REACTIVE ENERGY - OFF PEAK	3,714,166.56	4,335,425.76	4,108,893.12	3,866,848.80	4,592,764.80	5,487,510.24	4,820,098.56	4,078,744.80	4,550,119.20	4,916,180.16	4,117,608.00	3,847,509.12	**52,435,869.12**
REACTIVE ENERGY - STD	3,568,098.24	33,372,721.92	3,484,713.12	3,748,439.04	3,913,831.20	4,183,441.44	3,738,395.52	3,731,592.48	4,193,537.76	3,608,680.80	34,600,007.04	3,408,442.56	**105,551,901.12**
REACTIVE ENERGY - PEAK	1,426,005.12	1,264,218.24	1,409,515.68	1,495,392.48	15,558,493.76	1,672,933.44	1,461,916.80	1,436,120.64	1,640,296.32	1,382,837.28	1,373,324.64	1,278,012.00	**31,399,066.40**
EXCESS REACTIVE ENERGY	39,349.44	406,287.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67,782.52	**513,419.46**
LOAD FACTOR	64.00	58.00	63.00	67.00	74.00	74.00	73.00	74.00	69.00	73.00	69.00	67.00	***68.75***
CHARGES DETAILS													
Administration Charge @ R147.34 per day for monthdays	R 4,567.54	R 4,567.54	R 4,420.20	R 4,567.54	R 4,420.20	R 4,567.54	R 4,567.54	R 4,125.52	R 4,567.54	R 4,420.20	R 4,567.54	R 4,420.20	**R 53,779.10**
TX Network Capacity Charge R9.54/kVA	R 715,500.00	R 715,500.00	R 715,500.00	R 715,500.00	R 715,500.00	R 715,500.00	R 715,500.00	R 715,500.00	R 715,500.00	R 715,500.00	R 715,500.00	R 715,500.00	**R 8,586,000.00**
Network Capacity Charge R18.90/kVA	R 1,417,500.00	R 1,417,500.00	R 1,417,500.00	R 1,417,500.00	R 1,417,500.00	R 1,417,500.00	R 1,417,500.00	R 1,417,500.00	R 1,417,500.00	R 1,417,500.00	R 1,417,500.00	R 1,417,500.00	**R 17,010,000.00**
Network Demand Charge R35.83 /kVA	R 2,357,681.72	R 2,314,161.88	R 2,392,564.02	R 2,141,604.60	R 2,091,922.01	R 2,154,311.36	R 2,080,649.17	R 2,083,314.57	R 2,239,536.24	R 2,113,071.74	R 2,136,063.85	R 2,280,481.68	**R 26,385,362.84**
Ancillary Service Charge @ R0.0047 /kWh	R 146,009.84	R 128,042.10	R 139,986.22	R 137,082.05	R 141,048.73	R 148,884.29	R 142,588.95	R 132,118.92	R 146,057.98	R 140,657.99	R 141,288.82	R 142,164.41	**R 1,685,930.29**
High Season Off Peak Energy Charge @ R0.6068 /kWh	R 7,522,887.95	R 7,472,665.54	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 7,926,138.11	**R 22,921,691.60**
Low Season Off Peak Energy Charge @ R0.5253 /kWh			R 6,773,344.27	R 6,348,972.26	R 7,026,689.11	R 7,755,927.38	R 7,538,621.80	R 6,406,219.98	R 6,993,602.04	R 7,511,401.28	R 7,068,508.77	R -	**R 63,423,286.88**
High Season Peak Energy Charge @ R3.6885 / kWh	R 21,044,246.18	R 16,038,354.14	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 18,996,756.14	**R 56,079,356.46**
Low Season Peak Energy Charge @ R1.2034 / kWh			R 6,089,223.25	R 6,038,579.37	R 5,882,319.08	R 5,965,424.68	R 5,530,347.45	R 5,504,851.01	R 6,210,156.53	R 5,395,128.61	R 5,873,789.38	R -	**R 52,489,819.37**
High Season Standard Energy Charge @ R1.1174 /kWh	R 14,484,762.34	R 11,822,002.61		R -	R -	R -	R -	R -	R -	R -	R -	R 13,448,230.81	**R 39,754,995.76**
Low Season Standard Energy Charge @ R0.8282 /kWh			R 9,797,644.93	R 9,989,820.45	R 9,727,837.60	R 9,901,634.55	R 9,434,352.51	R 9,392,315.56	R 10,437,074.96	R 9,230,067.87	R 9,710,081.00	R -	**R 87,620,829.42**
Electrification and Rural Subsidy @ R0.0917 /kWh	R 2,848,745.14	R 2,498,183.01	R 2,731,220.49	R 2,674,558.24	R 2,751,950.75	R 2,904,827.48	R 2,782,001.48	R 2,577,724.41	R 2,849,684.51	R 2,744,327.17	R 2,756,635.06	R 2,773,718.31	**R 32,893,576.05**
High Season Reactive energy Charge @ R0.1656 /kvarh	R 6,516.19	R 67,281.29	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 11,224.86	**R 85,022.35**
Total Charges	**R 50,548,416.90**	**R 42,478,258.11**	**R 30,061,403.38**	**R 29,468,184.51**	**R 29,759,187.48**	**R 30,968,577.28**	**R 29,646,128.90**	**R 28,233,669.97**	**R 31,013,679.80**	**R 29,272,074.86**	**R 29,823,934.42**	**R 47,716,134.52**	**R 408,989,650.13**
Consumption Charges	R 43,051,896.47	R 35,333,022.29	R 22,660,212.45	R 22,377,372.08	R 22,636,845.79	R 23,622,986.61	R 22,503,321.76	R 21,303,386.56	R 23,640,833.52	R 22,136,597.76	R 22,652,379.14	R 40,371,125.06	**R 322,289,979.50**
Ancillary Charges	R 7,496,520.43	R 7,145,235.82	R 7,401,190.93	R 7,090,812.43	R 7,122,341.68	R 7,345,590.67	R 7,142,807.14	R 6,930,283.42	R 7,372,846.27	R 7,135,477.11	R 7,171,555.27	R 7,345,009.46	**R 86,699,670.64**
Consumption Charges as % of Total Charges	85.17%	83.18%	75.38%	75.94%	76.07%	76.28%	75.91%	75.45%	76.23%	75.62%	75.95%	84.61%	**77.98%**
Ancillary Charges as % of Total Charges	14.83%	14.14%	14.64%	14.03%	14.09%	14.53%	14.13%	13.71%	14.59%	14.12%	14.19%	14.53%	**14.29%**

Driefontein intake point Eskom summary (3 years)

Intake Point		Driefontein												
Premise ID		7032344358												
		Month												Totals / *Averages*
		Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	
Month Days		31	31	30	31	30	31	31	28	31	30	31	30	
Notified Max Demand		30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	3,000	30,000	*27,750*
Utilized Capacity		30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	32,829.37	32,829.37	32,829.37	32,829.37	32,829.37	32,829.37	32,829.37	*31,650*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		3,234,120.00	3,150,420.00										4,606,860.00	**10,991,400.00**
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				3,333,420.00	3,151,260.00	2,773,620.00	6,563,100.00	5,144,100.00	4,740,360.00	5,439,180.00	4,551,660.00	4,515,060.00		**40,211,760.00**
HIGH SEASON ENERGY CONSUMPTION STD kWh		3,485,400.00	3,623,400.00										4,531,800.00	**11,640,600.00**
LOW SEASON ENERGY CONSUMPTION STD kWh				3,146,760.00	3,831,420.00	3,208,500.00	5,081,520.00	5,722,440.00	5,274,300.00	5,455,500.00	4,727,280.00	5,061,180.00		**41,508,900.00**
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		1,399,560.00	1,420,800.00										1,623,480.00	**4,443,840.00**
LOW SEASON ENERGY CONSUMPTION PEAK kWh				1,238,460.00	1,604,340.00	1,355,100.00	1,931,640.00	2,254,920.00	2,044,020.00	2,122,860.00	1,914,840.00	1,921,020.00		**16,387,200.00**
ENERGY CONSUMPTION ALL kWh		8,119,080.00	8,194,620.00	7,718,640.00	8,587,020.00	7,337,220.00	13,576,260.00	13,121,460.00	12,058,680.00	13,017,540.00	11,193,780.00	11,497,260.00	10,762,140.00	**125,183,700.00**
DEMAND CONSUMPTION - OFF PEAK		14,382.48	14,361.94	14,786.80	21,249.48	14,642.95	27,482.35	26,114.82	26,309.57	25,747.20	23,263.91	21,713.36	19,820.35	**249,875.21**
SEASON DEMAND CONSUMPTION - STD		16,615.55	19,933.36	15,840.45	22,829.34	25,959.96	32,829.37	29,296.22	29,643.88	32,294.27	25,431.50	25,006.68	21,713.03	**297,393.61**
DEMAND CONSUMPTION - PEAK		15,466.97	19,019.14	15,749.28	22,302.25	24,792.41	32,180.14	28,613.89	28,426.83	29,608.64	25,713.90	24,101.78	20,929.94	**286,905.17**
DEMAND READING - KW/KVA		16,615.55	19,933.36	15,840.45	22,829.34	25,959.96	32,829.37	29,296.22	29,643.88	32,294.27	25,713.90	25,006.68	21,713.03	**297,676.01**
REACTIVE ENERGY - OFF PEAK		502,620.00	578,520.00	729,480.00	616,200.00	621,120.00	1,614,060.00	1,217,100.00	1,179,360.00	1,329,180.00	1,209,300.00	885,060.00	828,180.00	**11,310,180.00**
REACTIVE ENERGY - STD		626,700.00	749,460.00	740,700.00	866,220.00	787,920.00	1,408,140.00	1,592,940.00	1,482,360.00	1,497,660.00	1,429,080.00	1,237,260.00	1,001,280.00	**13,419,720.00**
REACTIVE ENERGY - PEAK		219,660.00	262,980.00	271,140.00	342,280.00	310,080.00	506,580.00	589,080.00	542,220.00	556,200.00	544,740.00	439,080.00	319,020.00	**4,903,060.00**
EXCESS REACTIVE ENERGY		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
LOAD FACTOR		66.00	56.00	69.00	52.00	41.00	58.00	63.00	63.00	56.00	62.00	64.00	70.00	*60*
CHARGES DETAILS														
Administration Charge per day for monthdays	R 119.2000	R 3,695.20	R 3,695.20	R 3,576.00	R 3,695.20	R 3,576.00	R 3,695.20	R 3,695.20	R 3,337.60	R 3,695.20	R 3,576.00	R 3,695.20	R 3,576.00	R **43,508.00**
TX Network Capacity Charge /kVA	R 7.7100	R 231,300.00	R 231,300.00	R 231,300.00	R 231,300.00	R 231,300.00	R 253,114.44	R 253,114.44	R 253,114.44	R 253,114.44	R 253,114.44	R 253,114.44	R 253,114.44	R **2,928,301.10**
Network Capacity Charge /kVA	R 15.2900	R 458,700.00	R 458,700.00	R 458,700.00	R 458,700.00	R 458,700.00	R 501,961.07	R 501,961.07	R 501,961.07	R 501,961.07	R 501,961.07	R 501,961.07	R 501,961.07	R **5,807,227.47**
Excess Network Capacity Charge 8,776.23 kVa @ R26.60	R 26.6000						R 65,075.74			R 105,536.42				
Network Demand Charge /kVA	R 28.9900	R 481,684.79	R 577,868.11	R 459,214.65	R 661,822.57	R 752,579.24	R 951,723.44	R 849,297.42	R 859,376.08	R 936,210.89	R 745,445.96	R 724,943.65	R 629,460.74	R **8,629,627.53**
Ancillary Service Charge /kWh	R 0.0038	R 30,852.50	R 31,139.56	R 29,330.83	R 32,630.68	R 27,881.44	R 51,589.79	R 49,861.55	R 45,822.98	R 49,466.65	R 42,536.36	R 43,689.59	R 40,896.13	R **475,698.06**
High Season Off Peak Energy Charge /kWh	R 0.4909	R 1,587,629.51	R 1,546,541.18	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 2,261,507.57	R **5,395,678.26**
Low Season Off Peak Energy Charge /kWh	R 0.4250	R -	R -	R 1,416,703.50	R 1,339,285.50	R 1,178,788.50	R 2,789,317.50	R 2,186,242.50	R 2,014,653.00	R 2,311,651.50	R 1,934,455.50	R 1,918,900.50	R -	R **17,089,998.00**
High Season Standard Energy Charge /kWh	R 0.9040	R 3,150,801.60	R 3,275,553.60	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 4,096,747.20	R **10,523,102.40**
Low Season Standard Energy Charge /kWh	R 0.6700	R -	R -	R 2,108,329.20	R 2,567,051.40	R 2,149,695.00	R 3,404,618.40	R 3,834,034.80	R 3,533,781.00	R 3,655,185.00	R 3,167,277.60	R 3,390,990.60	R -	R **27,810,963.00**
High Season Peak Energy Charge / kWh	R 2.9840	R 4,176,287.04	R 4,239,667.20	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 4,844,464.32	R **13,260,418.56**
Low Season Peak Energy Charge / kWh	R 0.9735	R -	R -	R 1,205,640.81	R 1,561,824.99	R 1,319,189.85	R 1,880,451.54	R 2,195,164.62	R 1,989,853.47	R 2,066,604.21	R 1,864,096.74	R 1,870,112.97	R -	R **15,952,939.20**
Electrification and Rural Subsidy /kWh	R 0.0742	R 602,435.74	R 608,040.80	R 572,723.09	R 637,156.88	R 544,421.72	R 1,007,358.49	R 973,612.33	R 894,754.06	R 965,901.47	R 830,578.48	R 853,096.69	R 798,550.79	R **9,288,630.54**
High Season Reactive energy Charge /kvarh	R 0.1340	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R **-**
Total Charges		**R 10,723,386.38**	**R 10,972,505.64**	**R 6,485,518.08**	**R 7,493,467.22**	**R 6,666,131.75**	**R 10,908,905.61**	**R 10,846,983.93**	**R 10,096,653.70**	**R 10,849,326.85**	**R 9,343,042.15**	**R 9,560,504.71**	**R 13,430,278.26**	**R 117,206,092.12**
Consumption Charges		R 8,914,718.15	R 9,061,761.98	R 4,730,673.51	R 5,468,161.89	R 4,647,673.35	R 8,074,387.44	R 8,215,441.92	R 7,538,287.47	R 8,033,440.71	R 6,965,829.84	R 7,180,004.07	R 11,202,719.09	R **90,033,099.42**
Ancillary Charges		R 1,808,668.23	R 1,910,743.67	R 1,754,844.57	R 2,025,305.33	R 2,018,458.40	R 2,834,518.17	R 2,631,542.01	R 2,558,366.23	R 2,815,886.14	R 2,377,212.31	R 2,380,500.64	R 2,227,559.17	R **27,172,992.70**
Consumption Charges as % of Total Charges		83.13%	82.59%	72.94%	72.97%	69.72%	74.02%	75.74%	74.66%	74.05%	74.56%	75.10%	83.41%	**76.07%**
Ancillary Charges as % of Total Charges		16.87%	17.41%	27.06%	27.03%	30.28%	25.98%	24.26%	25.34%	25.95%	25.44%	24.90%	16.59%	**23.93%**

Intake Point		Driefontein												
Premise ID		7032344358												
		Month												Totals / *Averages*
		Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	
Month Days		31	31	30	31	30	31	31	29	31	30	31	30	
Notified Max Demand		30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	3,000	30,000	*27,750*
Utilized Capacity		32,829.37	32,829.37	32,829.37	32,829.37	32,829.37	34,388.11	34,388.11	34,388.11	34,388.11	34,388.11	34,388.11	34,388.11	*33,739*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		4,108,980.00	4,157,700.00										3,582,120.00	**11,848,800.00**
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				4,491,060.00	4,322,640.01	4,550,040.00	6,130,740.00	4,973,820.00	4,958,400.00	4,866,540.00	3,641,640.00	3,720,420.00		**41,655,300.01**
HIGH SEASON ENERGY CONSUMPTION STD kWh		5,031,840.00	4,724,100.00										3,966,240.00	**13,722,180.00**
LOW SEASON ENERGY CONSUMPTION STD kWh				4,554,780.00	4,917,480.00	5,186,160.00	5,117,400.00	5,225,520.00	5,262,420.00	5,132,580.00	2,817,360.00	3,429,480.00		**41,643,180.00**
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		1,949,100.00	1,715,760.00										1,499,280.00	**5,164,140.00**
LOW SEASON ENERGY CONSUMPTION PEAK kWh				1,796,700.00	2,060,460.00	2,003,820.00	1,827,780.00	2,101,320.00	2,018,520.00	2,080,620.00	1,123,800.00	1,299,840.00		**16,312,860.00**
ENERGY CONSUMPTION ALL kWh		11,089,920.00	10,597,560.00	10,842,540.00	11,300,580.01	11,740,020.00	13,075,920.00	12,300,660.00	12,239,340.00	12,079,740.00	7,582,800.00	8,449,740.00	9,047,640.00	**130,346,460.01**
DEMAND CONSUMPTION - OFF PEAK		20,201.38	20,256.90	21,512.48	21,398.05	25,700.45	27,632.32	24,779.63	28,499.58	25,241.39	13,696.83	20,242.68	16,258.86	**265,420.55**
SEASON DEMAND CONSUMPTION - STD		22,647.91	21,163.93	23,838.65	24,333.67	28,620.44	34,388.11	28,391.09	31,348.30	28,056.65	14,190.98	20,201.38	18,591.86	**295,772.97**
DEMAND CONSUMPTION - PEAK		21,229.48	20,221.69	23,539.58	23,137.91	26,851.32	30,576.46	27,826.80	30,206.17	30,230.47	13,932.40	15,391.84	18,333.31	**281,477.43**
DEMAND READING - KW/KVA		22,647.91	21,163.93	23,838.65	24,333.67	28,620.44	34,388.11	28,391.09	31,384.30	30,230.47	14,190.98	20,242.68	18,591.86	**298,024.09**
REACTIVE ENERGY - OFF PEAK		687,200.00	706,800.00	950,700.00	851,520.00	903,960.00	1,418,220.00	1,393,800.00	1,399,740.00	1,281,000.00	705,180.00	557,280.00	541,080.00	**11,396,480.00**
REACTIVE ENERGY - STD		1,048,860.00	954,720.00	1,091,460.00	1,102,500.00	1,201,620.00	1,239,240.00	1,568,460.00	1,570,320.00	1,438,260.00	533,280.00	563,100.00	672,780.00	**12,984,600.00**
REACTIVE ENERGY - PEAK		358,200.00	310,920.00	402,960.00	426,540.00	432,240.00	418,140.00	598,080.00	564,900.00	541,860.00	203,340.00	195,120.00	232,560.00	**4,684,860.00**
EXCESS REACTIVE ENERGY		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
LOAD FACTOR		67.00	69.00	66.00	64.00	59.00	52.00	60.00	58.00	55.00	75.00	57.00	68.00	***62.5***
CHARGES DETAILS														
Administration Charge per day for monthdays	R 137.8300	R 4,272.73	R 4,272.73	R 4,134.90	R 4,272.73	R 4,134.90	R 4,272.73	R 4,272.73	R 3,997.07	R 4,272.73	R 4,134.90	R 4,272.73	R 4,134.90	**R 50,445.78**
TX Network Capacity Charge /kVA	R 8.9200	R 292,837.98	R 292,837.98	R 292,837.98	R 292,837.98	R 292,837.98	R 306,741.94	R 306,741.94	R 306,741.94	R 306,741.94	R 306,741.94	R 306,741.94	R 306,741.94	**R 3,611,383.49**
Network Capacity Charge /kVA	R 17.6800	R 580,423.26	R 580,423.26	R 580,423.26	R 580,423.26	R 580,423.26	R 607,981.78	R 607,981.78	R 607,981.78	R 607,981.78	R 607,981.78	R 607,981.78	R 607,981.78	**R 7,157,988.80**
Excess Network Capacity Charge 8,776.23 kVa @ R26.60	R 26.6000						R 233,447.72							
Network Demand Charge /kVA	R 33.5200	R 759,157.94	R 709,414.93	R 799,071.55	R 815,664.62	R 959,357.15	R 1,152,689.45	R 951,669.34	R 1,052,001.74	R 1,013,325.35	R 475,681.65	R 678,534.63	R 623,199.15	**R 9,989,767.50**
Ancillary Service Charge /kWh	R 0.0044	R 48,795.65	R 46,629.26	R 47,707.18	R 49,722.55	R 51,656.09	R 57,534.05	R 54,122.90	R 53,853.10	R 53,150.86	R 33,364.32	R 37,178.86	R 39,809.62	**R 573,524.42**
High Season Off Peak Energy Charge /kWh	R 0.5676	R 2,332,257.05	R 2,359,910.52	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 2,033,211.31	**R 6,725,378.88**
Low Season Off Peak Energy Charge /kWh	R 0.4914	R -	R -	R 2,206,906.88	R 2,124,145.30	R 2,235,889.66	R 3,012,645.64	R 2,444,135.15	R 2,436,557.76	R 2,391,417.76	R 1,789,501.90	R 1,828,214.39	R -	**R 20,469,414.42**
High Season Standard Energy Charge /kWh	R 1.0453	R 5,259,782.35	R 4,938,101.73	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 4,145,910.67	**R 14,343,794.75**
Low Season Standard Energy Charge /kWh	R 0.7747	R -	R -	R 3,528,588.07	R 3,809,571.76	R 4,017,718.15	R 3,964,449.78	R 4,048,210.34	R 4,076,796.77	R 3,976,209.73	R 2,182,608.79	R 2,656,818.16	R -	**R 32,260,971.55**
High Season Peak Energy Charge/ kWh	R 3.4504	R 6,725,174.64	R 5,920,058.30	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 5,173,115.71	**R 17,818,348.66**
Low Season Peak Energy Charge /kWh	R 1.1257	R -	R -	R 2,022,545.19	R 2,319,459.82	R 2,255,700.17	R 2,057,531.95	R 2,365,455.92	R 2,272,247.96	R 2,342,153.93	R 1,265,061.66	R 1,463,229.89	R -	**R 18,363,386.50**
Electrification and Rural Subsidy /kWh	R 0.0858	R 951,515.14	R 909,270.65	R 930,289.93	R 969,589.76	R 1,007,293.72	R 1,121,913.94	R 1,055,396.63	R 1,050,135.37	R 1,036,441.69	R 650,604.24	R 724,987.69	R 776,287.51	**R 11,183,726.27**
High Season Reactive energy Charge /kvarh	R 0.1549	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	**R -**
Total Charges		**R 16,954,216.74**	**R 15,760,919.37**	**R 10,412,504.94**	**R 10,965,687.78**	**R 11,405,011.08**	**R 12,519,208.97**	**R 11,837,986.74**	**R 11,860,313.50**	**R 11,731,695.77**	**R 7,315,681.18**	**R 8,307,960.07**	**R 13,710,392.60**	**R 142,548,131.02**
Consumption Charges		R 14,317,214.04	R 13,218,070.55	R 7,758,040.14	R 8,253,176.87	R 8,509,307.98	R 9,034,627.36	R 8,857,801.42	R 8,785,602.50	R 8,709,781.42	R 5,237,172.35	R 5,948,262.43	R 11,352,237.70	**R 109,981,294.76**
Ancillary Charges		R 2,637,002.70	R 2,542,848.82	R 2,654,464.80	R 2,712,510.91	R 2,895,703.09	R 3,484,581.61	R 2,980,185.32	R 3,074,711.00	R 3,021,914.36	R 2,078,508.84	R 2,359,697.64	R 2,358,154.90	**R 32,566,836.26**
Consumption Charges as % of Total Charges		84.45%	83.87%	74.51%	75.26%	74.61%	72.17%	74.83%	74.08%	74.24%	71.59%	71.60%	82.80%	**76.17%**
Ancillary Charges as % of Total Charges		15.55%	16.13%	25.49%	24.74%	25.39%	27.83%	25.17%	25.92%	25.76%	28.41%	28.40%	17.20%	**23.83%**

Intake Point	Driefontein
Premise ID	7032344358

	Month												Totals / *Averages*
	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	
Notified Max Demand	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	***30,000***
Utilized Capacity	34,388.11	34,388.11	34,388.11	34,388.11	34,388.11	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	***31,828.38***
CONSUMPTION DETAILS													
ENERGY CONSUMPTION OFF PEAK kWH	3,535,800.00	4,184,880.00	3,968,520.00	4,106,460.00	4,503,540.00	5,757,720.00	5,485,920.00	4,612,440.00	4,847,940.00	5,127,060.00	4,400,400.00	3,954,840.00	**54,485,520.00**
ENERGY CONSUMPTION STD kWh	4,216,860.00	4,033,500.00	4,168,620.00	4,737,420.00	4,739,640.00	5,590,980.00	5,135,520.00	5,015,400.00	5,277,960.00	4,665,840.00	4,500,120.00	4,364,040.00	**56,445,900.00**
ENERGY CONSUMPTION PEAK kWh	1,715,640.00	1,549,140.00	1,754,940.00	1,886,880.00	1,899,600.00	2,244,300.00	1,913,340.00	1,916,880.00	2,046,960.00	1,805,640.00	1,807,800.00	1,735,620.00	**22,276,740.00**
ENERGY CONSUMPTION ALL kWh	9,468,300.00	9,767,520.00	9,892,080.00	10,730,760.00	11,142,780.00	13,593,000.00	12,534,780.00	11,544,720.00	12,172,860.00	11,598,540.00	10,708,320.00	10,054,500.00	**133,208,160.00**
DEMAND CONSUMPTION - OFF PEAK	20,478.90	17,955.14	19,077.35	19,511.35	20,491.91	27,125.57	23,228.29	25,994.61	25,365.17	23,264.22	19,960.44	19,772.34	**262,225.29**
DEMAND CONSUMPTION - STD	22,475.90	21,622.65	23,016.23	24,705.14	23,803.89	29,818.24	27,609.65	28,349.73	27,952.53	25,403.74	22,850.47	23,945.03	**301,553.20**
DEMAND CONSUMPTION - PEAK	18,278.24	18,667.61	22,621.51	24,668.68	23,150.98	29,342.88	27,543.85	28,576.38	28,015.82	25,091.19	21,148.95	25,146.51	**292,252.60**
DEMAND READING - KW/KVA	22,475.91	21,622.65	23,016.24	24,705.14	23,803.90	29,818.25	27,609.65	28,576.38	28,015.82	25,403.75	22,850.47	25,146.51	**303,044.67**
REACTIVE ENERGY - OFF PEAK	425,280.00	5,602,220.00	609,720.00	656,940.00	943,080.00	1,190,760.00	1,096,620.00	1,195,620.00	1,511,100.00	1,511,100.00	1,103,220.00	767,160.00	**16,612,820.00**
REACTIVE ENERGY - STD	602,880.00	600,420.00	717,600.00	941,340.00	1,195,440.00	1,380,360.00	1,229,880.00	1,421,160.00	1,578,960.00	1,578,960.00	1,326,960.00	944,340.00	**13,518,300.00**
REACTIVE ENERGY - PEAK	228,420.00	211,860.00	277,980.00	347,280.00	439,140.00	519,240.00	422,160.00	506,400.00	579,720.00	579,720.00	499,080.00	361,500.00	**4,972,500.00**
EXCESS REACTIVE ENERGY	6.00	24.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	648.00	**678.00**
LOAD FACTOR	57.00	61.00	60.00	61.00	67.00	63.00	63.00	63.00	63.00	68.00	65.00	57.00	***62.33***
CHARGES DETAILS													
Administration Charge @ R147.34 per day for monthdays	R 4,567.54	R 4,567.54	R 4,420.20	R 4,567.54	R 4,420.20	R 4,567.54	R 4,567.54	R 4,125.52	R 4,567.54	R 4,420.20	R 4,567.54	R 4,420.20	**R 53,779.10**
TX Network Capacity Charge R9.54/kVA	R 328,062.57	R 328,062.57	R 328,062.57	R 328,062.57	R 328,062.57	R 286,200.00	R 286,200.00	R 286,200.00	R 286,200.00	R 286,200.00	R 286,200.00	R 286,200.00	**R 3,643,712.85**
Network Capacity Charge R18.90/kVA	R 649,935.28	R 649,935.28	R 649,935.28	R 649,935.28	R 649,935.28	R 567,000.00	R 567,000.00	R 567,000.00	R 567,000.00	R 567,000.00	R 567,000.00	R 567,000.00	**R 7,218,676.40**
Network Demand Charge R35.83 /kVA	R 805,311.86	R 774,739.55	R 824,671.88	R 885,185.17	R 852,893.74	R 1,068,387.90	R 989,253.76	R 1,023,891.70	R 1,003,806.83	R 910,216.36	R 818,732.34	R 900,999.45	**R 10,858,090.53**
Ancillary Service Charge @ R0.0047 /kWh	R 44,501.01	R 45,907.34	R 46,492.78	R 50,434.57	R 52,371.07	R 63,887.10	R 58,913.47	R 54,260.18	R 57,212.44	R 54,513.14	R 50,329.10	R 47,256.15	**R 626,078.35**
High Season Off Peak Energy Charge @ R0.6068 /kWh	R 2,145,523.44	R 2,539,385.18	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 2,399,796.91	**R 7,084,705.54**
Low Season Off Peak Energy Charge @ R0.5253 /kWh			R 2,084,663.56	R 2,157,123.44	R 2,365,709.56	R 3,024,530.32	R 2,881,753.78	R 2,422,914.73	R 2,546,622.88	R 2,693,244.62	R 2,311,530.12	R -	**R 22,488,093.00**
High Season Peak Energy Charge @ R3.6885 / kWh	R 6,328,138.14	R 5,714,002.89	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 6,401,834.37	**R 18,443,975.40**
Low Season Peak Energy Charge @ R1.2034 / kWh			R 2,111,894.80	R 2,270,671.39	R 2,285,978.64	R 2,700,790.62	R 2,302,513.36	R 2,306,773.39	R 2,463,311.66	R 2,172,907.18	R 2,175,506.52	R -	**R 20,790,347.56**
High Season Standard Energy Charge @ R1.1174 /kWh	R 4,711,919.36	R 4,507,032.90		R -	R -	R -	R -	R -	R -	R -	R -	R 4,876,378.30	**R 14,095,330.56**
Low Season Standard Energy Charge @ R0.8282 /kWh			R 3,452,451.08	R 3,923,531.24	R 3,925,369.85	R 4,630,449.64	R 4,253,237.66	R 4,153,754.28	R 4,371,206.47	R 3,864,248.69	R 3,726,999.38	R -	**R 36,301,248.30**
Electrification and Rural Subsidy @ R0.0917 /kWh	R 868,243.11	R 895,681.58	R 907,103.74	R 984,010.69	R 1,021,792.93	R 1,246,478.10	R 1,149,439.33	R 1,058,650.82	R 1,116,251.26	R 1,063,586.12	R 981,952.94	R 921,997.65	**R 12,215,188.27**
High Season Reactive energy Charge @ R0.1656 /kvarh	R 0.99	R 3.97	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 107.31	**R 112.28**
Total Charges	**R 15,886,203.30**	**R 15,459,318.80**	**R 10,409,695.89**	**R 11,253,521.89**	**R 11,486,533.84**	**R 13,592,291.22**	**R 12,492,878.90**	**R 11,877,570.62**	**R 12,416,179.08**	**R 11,616,336.31**	**R 10,922,817.94**	**R 16,405,990.34**	**R 153,819,338.12**
Consumption Charges	R 13,185,580.94	R 12,760,420.97	R 7,649,009.44	R 8,351,326.07	R 8,577,058.05	R 10,355,770.57	R 9,437,504.80	R 8,883,442.40	R 9,381,141.02	R 8,730,400.48	R 8,214,036.02	R 13,678,009.58	**R 119,203,700.35**
Ancillary Charges	R 2,700,622.36	R 2,698,897.83	R 2,760,686.45	R 2,902,195.82	R 2,909,475.79	R 3,236,520.65	R 3,055,374.10	R 2,994,128.22	R 3,035,038.06	R 2,885,935.83	R 2,708,781.92	R 2,727,980.76	**R 34,615,637.77**
Consumption Charges as % of Total Charges	83.00%	82.54%	73.48%	74.21%	74.67%	76.19%	75.54%	74.79%	75.56%	75.16%	75.20%	83.37%	**76.98%**
Ancillary Charges as % of Total Charges	17.00%	16.99%	17.38%	18.27%	18.31%	20.37%	19.23%	18.85%	19.10%	18.17%	17.05%	17.17%	**18.16%**

Shakaskraal intake point Eskom summary (3 years)

Intake Point		Shakaskraal												
Premise ID		8851805893												
		Month												Totals / *Averages*
		Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	
Month Days		31	31	30	31	30	31	31	28	31	30	31	30	
Notified Max Demand		42,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	*46,583*
Utilized Capacity		42,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	*46,583*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		6,582,935.14	6,491,306.23										5,835,749.04	**18,909,990.41**
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				6,956,718.99	6,164,374.67	6,629,000.85	7,653,097.03	6,338,944.14	5,793,125.02	6,632,026.92	6,291,795.96	5,841,822.24		**58,300,905.82**
HIGH SEASON ENERGY CONSUMPTION STD kWh		7,323,620.51	7,452,011.00										5,685,804.00	**20,461,435.51**
LOW SEASON ENERGY CONSUMPTION STD kWh				6,691,656.24	7,263,886.56	7,484,747.96	5,641,944.95	6,307,348.93	5,857,290.23	5,955,935.22	5,695,510.68	6,227,922.96		**57,126,243.73**
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		3,188,355.46	3,169,214.40										2,409,710.58	**8,767,280.44**
LOW SEASON ENERGY CONSUMPTION PEAK kWh				2,707,080.98	3,201,943.14	3,274,282.46	2,242,358.48	2,708,306.93	2,463,517.04	2,540,143.98	2,477,925.00	2,596,750.56		**24,212,308.57**
ENERGY CONSUMPTION ALL kWh		17,094,911.11	17,112,531.63	16,355,456.21	16,630,204.37	17,388,031.27	15,537,400.46	15,354,600.00	14,113,932.29	15,128,106.12	14,465,231.64	14,666,495.76	13,931,263.62	**187,778,164.48**
DEMAND CONSUMPTION - OFF PEAK		32,646.87	34,941.29	31,734.52	30,734.04	32,774.54	30,651.79	30,467.54	30,756.72	30,611.28	36,322.24	28,807.61	28,274.24	**378,722.68**
SEASON DEMAND CONSUMPTION - STD		33,970.61	34,151.85	33,950.90	35,014.74	38,365.18	31,239.31	29,436.80	30,317.66	32,988.48	33,160.95	31,976.59	29,306.44	**393,879.51**
DEMAND CONSUMPTION - PEAK		37,777.76	37,436.31	35,788.03	35,551.74	37,942.27	34,768.42	30,117.04	35,088.82	34,510.90	32,118.05	32,145.46	33,001.88	**416,246.68**
DEMAND READING - KW/KVA		37,777.76	37,436.31	35,788.03	35,551.74	38,365.18	34,768.42	30,467.54	35,088.82	34,510.90	33,160.95	32,145.46	33,001.88	**418,062.99**
REACTIVE ENERGY - OFF PEAK		1,700,129.16	1,668,253.68	1,883,862.54	1,937,781.36	2,105,712.18	2,496,942.54	2,035,421.46	1,867,280.58	2,112,721.20	1,829,501.64	1,707,719.04	1,592,345.70	**22,937,671.08**
REACTIVE ENERGY - STD		2,134,936.26	2,148,311.70	1,977,711.30	2,376,939.24	2,486,667.42	1,849,569.84	2,045,304.36	1,993,168.62	2,018,884.68	1,790,959.68	1,895,144.40	1,676,616.66	**24,394,214.16**
REACTIVE ENERGY - PEAK		795,647.34	787,167.72	738,405.72	970,403.94	1,016,668.08	682,418.88	820,528.38	775,796.22	805,544.18	720,503.10	724,837.50	607,026.96	**9,444,948.02**
EXCESS REACTIVE ENERGY		69,612.55	69,262.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	87,392.08	**226,267.40**
LOAD FACTOR		62.00	63.00	65.00	64.00	65.00	62.00	70.00	61.00	61.00	57.00	63.00	60.00	*62.75*
CHARGES DETAILS														
Administration Charge per day for monthdays	R 119.2000	R 3,695.20	R 3,695.20	R 3,576.00	R 3,695.20	R 3,576.00	R 3,695.20	R 3,695.20	R 3,337.60	R 3,695.20	R 3,576.00	R 3,695.20	R 3,576.00	**R 43,508.00**
TX Network Capacity Charge /kVA	R 7.7100	R 323,820.00	R 362,370.00	R 362,370.00	R 362,370.00	R 362,370.00	R 362,370.00	R 362,370.00	R 362,370.00	R 362,370.00	R 362,370.00	R 362,370.00	R 362,370.00	**R 4,309,890.00**
Network Capacity Charge /kVA	R 15.2900	R 642,180.00	R 718,630.00	R 718,630.00	R 718,630.00	R 718,630.00	R 718,630.00	R 718,630.00	R 718,630.00	R 718,630.00	R 718,630.00	R 718,630.00	R 718,630.00	**R 8,547,110.00**
Excess Network Capacity Charge 8,776.23 kVa @ R26.60	R 26.6000													
Network Demand Charge /kVA	R 28.9900	R 1,095,177.26	R 1,085,278.63	R 1,037,494.99	R 1,030,644.94	R 1,112,206.57	R 1,007,936.50	R 883,253.98	R 1,017,224.89	R 1,000,470.99	R 961,335.94	R 931,896.89	R 956,724.50	**R 12,119,646.08**
Ancillary Service Charge /kWh	R 0.0038	R 64,960.66	R 65,027.62	R 62,150.73	R 63,194.78	R 66,074.52	R 59,042.12	R 58,347.48	R 53,632.94	R 57,486.80	R 54,967.88	R 55,732.68	R 52,938.80	**R 713,557.02**
High Season Off Peak Energy Charge /kWh	R 0.4909	R 3,231,562.79	R 3,186,582.12	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 2,864,769.18	**R 9,282,914.09**
Low Season Off Peak Energy Charge /kWh	R 0.4250	R -	R -	R 2,956,605.58	R 2,619,859.38	R 2,817,325.43	R 3,252,566.23	R 2,694,051.20	R 2,462,078.13	R 2,818,611.48	R 2,674,013.30	R 2,482,774.35	R -	**R 24,777,885.05**
High Season Standard Energy Charge /kWh	R 0.9040	R 6,620,553.38	R 6,736,617.94	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 5,139,966.82	**R 18,497,138.14**
Low Season Standard Energy Charge /kWh	R 0.6700	R -	R -	R 4,483,409.52	R 4,866,804.29	R 5,014,781.16	R 3,780,103.15	R 4,225,923.83	R 3,924,384.30	R 3,990,476.45	R 3,815,992.37	R 4,172,708.41	R -	**R 38,274,583.48**
High Season Peak Energy Charge / kWh	R 2.9840	R 9,514,051.32	R 9,456,934.58	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 7,190,577.62	**R 26,161,563.52**
Low Season Peak Energy Charge / kWh	R 0.9735	R -	R -	R 2,635,343.35	R 3,117,091.51	R 3,187,513.53	R 2,182,935.51	R 2,636,536.86	R 2,398,233.80	R 2,472,830.18	R 2,412,259.99	R 2,527,937.10	R -	**R 23,570,681.84**
Electrification and Rural Subsidy /kWh	R 0.0742	R 1,268,442.40	R 1,269,749.87	R 1,213,574.84	R 1,233,961.14	R 1,290,191.90	R 1,152,875.08	R 1,139,311.32	R 1,047,253.75	R 1,122,505.47	R 1,073,320.21	R 1,088,254.00	R 1,033,699.79	**R 13,933,139.77**
High Season Reactive energy Charge /kvarh	R 0.1340	R 9,328.14	R 9,281.24	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 11,710.53	**R 30,319.91**
Service charge	R 3,732.5100	R 115,707.81	R 115,707.81	R 111,975.30	R 115,707.81	R 111,975.30	R 115,707.81	R 115,707.81	R 104,510.28	R 115,707.81	R 111,975.30	R 115,707.81	R 111,975.30	**R 47,338.37**
Total Charges		**R 22,889,478.97**	**R 23,009,875.01**	**R 13,585,130.31**	**R 14,131,959.04**	**R 14,684,644.40**	**R 12,635,861.59**	**R 12,837,827.69**	**R 12,091,655.69**	**R 12,662,784.38**	**R 12,188,440.99**	**R 12,459,706.44**	**R 18,446,938.55**	**R 180,309,275.28**
Consumption Charges		R 19,366,167.50	R 19,380,134.64	R 10,075,358.45	R 10,603,755.18	R 11,019,620.11	R 9,215,604.89	R 9,556,511.89	R 8,784,696.22	R 9,281,918.11	R 8,902,265.66	R 9,183,419.86	R 15,195,313.62	**R 140,564,766.12**
Ancillary Charges		R 3,523,311.47	R 3,629,740.37	R 3,509,771.86	R 3,528,203.86	R 3,665,024.29	R 3,420,256.71	R 3,281,315.79	R 3,306,959.47	R 3,380,866.27	R 3,286,175.34	R 3,276,286.58	R 3,251,624.92	**R 39,697,170.78**
Consumption Charges as % of Total Charges		84.61%	84.23%	74.16%	75.03%	75.04%	72.93%	74.44%	72.65%	73.30%	73.04%	73.70%	82.37%	**76.29%**
Ancillary Charges as % of Total Charges		15.39%	15.77%	25.84%	24.97%	24.96%	27.07%	25.56%	27.35%	26.70%	26.96%	26.30%	17.63%	**23.71%**

Intake Point		Shakaskraal												
Premise ID		8851805893												
		Month												Totals / *Averages*
		Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	
Month Days		31	31	30	31	30	31	31	29	31	30	31	30	
Notified Max Demand		47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	*47,000*
Utilized Capacity		47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	*47,000*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		5,283,380.16	5,660,539.74										5,091,613.56	**16,035,533.46**
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				5,632,413.12	5,394,425.93	5,504,684.39	6,900,584.40	6,854,392.08	5,910,968.16	6,290,176.86	5,786,408.88	5,241,301.02		**53,515,354.84**
HIGH SEASON ENERGY CONSUMPTION STD kWh		6,399,956.16	6,144,723.54										5,725,159.38	**18,269,839.08**
LOW SEASON ENERGY CONSUMPTION STD kWh				5,738,523.66	6,089,319.53	5,922,580.85	5,329,542.96	6,840,480.42	5,607,093.24	6,231,992.58	4,904,090.28	5,009,781.60		**51,673,405.12**
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		2,956,763.16	2,636,671.50										2,483,532.36	**8,076,967.02**
LOW SEASON ENERGY CONSUMPTION PEAK kWh				2,481,910.74	2,802,870.35	2,492,103.77	2,021,274.90	2,832,887.34	2,337,895.62	2,707,400.70	1,987,310.52	2,056,544.10		**21,720,198.04**
ENERGY CONSUMPTION ALL kWh		14,640,099.48	14,441,934.78	13,852,847.52	14,286,615.81	13,919,369.01	14,251,402.26	16,527,759.84	13,855,957.02	15,229,570.14	12,677,809.68	12,307,626.72	13,300,305.30	**169,291,297.56**
DEMAND CONSUMPTION - OFF PEAK		29,801.44	33,212.33	27,494.06	27,491.74	26,375.07	28,091.83	31,702.95	31,275.85	30,628.56	29,290.40	28,449.48	30,095.53	**353,909.24**
SEASON DEMAND CONSUMPTION - STD		29,880.11	37,369.39	31,226.24	29,134.76	29,170.29	34,322.96	36,437.85	31,228.09	32,018.68	33,042.42	31,819.84	30,875.59	**386,526.22**
DEMAND CONSUMPTION - PEAK		33,117.55	38,789.60	31,215.32	31,040.33	30,588.07	31,478.31	35,619.77	33,460.99	33,723.58	30,068.09	30,904.68	33,941.47	**393,947.76**
DEMAND READING - KW/KVA		33,117.55	38,789.60	31,226.24	31,040.33	30,588.07	34,322.96	36,437.85	33,460.99	33,723.58	33,042.42	31,819.84	33,941.47	**401,510.90**
REACTIVE ENERGY - OFF PEAK		1,478,295.36	1,595,492.82	1,590,137.10	1,578,172.14	1,642,836.42	2,407,688.46	2,640,211.38	2,170,873.26	2,110,771.98	1,866,394.44	1,732,374.54	1,530,207.90	**22,343,455.80**
REACTIVE ENERGY - STD		2,012,377.50	1,843,583.76	1,710,142.20	1,846,413.54	1,855,916.10	1,778,505.30	2,819,847.06	2,056,709.16	2,118,381.12	1,437,636.78	1,588,330.08	1,774,638.90	**22,842,481.50**
REACTIVE ENERGY - PEAK		762,178.50	665,599.86	682,275.96	767,388.60	720,357.47	641,091.24	1,120,367.70	812,451.60	851,777.28	548,049.78	612,091.26	656,947.08	**8,840,576.33**
EXCESS REACTIVE ENERGY		176,651.92	128,953.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	127,624.82	**433,230.54**
LOAD FACTOR		61.00	51.00	62.00	63.00	66.00	58.00	65.00	61.00	63.00	54.00	53.00	56.00	***59.41666667***
CHARGES DETAILS														
Administration Charge per day for monthdays	R 137.8300	R 4,272.73	R 4,272.73	R 4,134.90	R 4,272.73	R 4,134.90	R 4,272.73	R 4,272.73	R 3,997.07	R 4,272.73	R 4,134.90	R 4,272.73	R 4,134.90	R **50,445.78**
TX Network Capacity Charge /kVA	R 8.9200	R 419,240.00	R 419,240.00	R 419,240.00	R 419,240.00	R 419,240.00	R 419,240.00	R 419,240.00	R 419,240.00	R 419,240.00	R 419,240.00	R 419,240.00	R 419,240.00	R **5,030,880.00**
Network Capacity Charge/kVA	R 17.6800	R 830,960.00	R 830,960.00	R 830,960.00	R 830,960.00	R 830,960.00	R 830,960.00	R 830,960.00	R 830,960.00	R 830,960.00	R 830,960.00	R 830,960.00	R 830,960.00	R **9,971,520.00**
Excess Network Capacity Charge 8,776.23 kVa @ R26.60	R 26.6000													
Network Demand Charge /kVA	R 33.5200	R 1,110,100.28	R 1,300,227.39	R 1,046,708.56	R 1,040,471.86	R 1,025,312.11	R 1,150,505.62	R 1,221,396.73	R 1,121,612.38	R 1,130,414.40	R 1,107,581.92	R 1,066,601.04	R 1,137,718.07	R **13,458,645.37**
Ancillary Service Charge /kWh	R 0.0044	R 64,416.44	R 63,544.51	R 60,952.53	R 62,861.11	R 61,245.22	R 62,706.17	R 72,722.14	R 60,966.21	R 67,010.11	R 55,782.36	R 54,153.56	R 58,521.34	R **744,881.71**
High Season Off Peak Energy Charge /kWh	R 0.5676	R 2,998,846.49	R 3,212,922.50	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 2,890,000.11	R **9,101,769.10**
Low Season Off Peak Energy Charge /kWh	R 0.4914	R -	R -	R 2,767,767.75	R 2,650,820.94	R 2,705,001.72	R 3,390,946.98	R 3,368,248.23	R 2,904,649.68	R 3,090,992.98	R 2,843,441.38	R 2,575,575.31	R -	R **26,297,444.96**
High Season Standard Energy Charge /kWh	R 1.0453	R 6,689,874.01	R 6,423,080.00	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 5,984,508.70	R **19,097,462.71**
Low Season Standard Energy Charge /kWh	R 0.7747	R -	R -	R 4,445,634.54	R 4,717,396.20	R 4,588,223.50	R 4,128,796.96	R 5,299,319.86	R 4,343,814.95	R 4,827,924.98	R 3,799,198.52	R 3,881,078.12	R -	R **40,031,387.63**
High Season Peak Energy Charge/ kWh	R 3.4504	R 10,202,015.06	R 9,097,573.07	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 8,569,178.81	R **27,868,766.94**
Low Season Peak Energy Charge / kWh	R 1.1257	R -	R -	R 2,793,887.21	R 3,155,190.76	R 2,805,361.47	R 2,275,349.27	R 3,188,980.90	R 2,631,769.53	R 3,047,721.31	R 2,237,115.99	R 2,315,051.58	R -	R **24,450,428.01**
Electrification and Rural Subsidy /kWh	R 0.0858	R 1,256,120.49	R 1,239,118.02	R 1,188,574.36	R 1,225,791.65	R 1,194,281.86	R 1,222,770.29	R 1,418,081.81	R 1,188,841.11	R 1,306,697.11	R 1,087,756.10	R 1,055,994.40	R 1,141,166.17	R **14,525,193.37**
High Season Reactive energy Charge /kvarh	R 0.1549	R 27,363.39	R 19,974.97	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 19,769.11	R **67,107.48**
Service charge	R 4,315.8900	R 133,792.59	R 133,792.59	R 129,476.70	R 133,792.59	R 129,476.70	R 133,792.59	R 133,792.59	R 125,160.81	R 133,792.59	R 129,476.70	R 133,792.59	R 129,476.70	R **47,338.37**
Total Charges		**R 23,737,001.47**	**R 22,744,705.79**	**R 13,687,331.56**	**R 14,240,797.84**	**R 13,763,237.48**	**R 13,619,340.61**	**R 15,957,014.98**	**R 13,631,011.74**	**R 14,859,026.20**	**R 12,514,687.88**	**R 12,336,719.32**	**R 21,184,673.92**	**R 190,743,271.42**
Consumption Charges		R 19,890,735.55	R 18,733,575.57	R 10,007,289.50	R 10,523,407.90	R 10,098,586.69	R 9,795,093.21	R 11,856,548.98	R 9,880,234.15	R 10,966,639.26	R 8,879,755.90	R 8,771,705.01	R 17,443,687.62	R **146,847,259.34**
Ancillary Charges		R 3,846,265.92	R 4,011,130.22	R 3,680,042.05	R 3,717,389.94	R 3,664,650.79	R 3,824,247.40	R 4,100,466.00	R 3,750,777.59	R 3,892,386.94	R 3,634,931.98	R 3,565,014.31	R 3,740,986.30	R **43,848,673.71**
Consumption Charges as % of Total Charges		83.80%	82.36%	73.11%	73.90%	73.37%	71.92%	74.30%	72.48%	73.80%	70.95%	71.10%	82.34%	**75.29%**
Ancillary Charges as % of Total Charges		16.20%	17.64%	26.89%	26.10%	26.63%	28.08%	25.70%	27.52%	26.20%	29.05%	28.90%	17.66%	**24.71%**

Intake Point	Shakaskraal
Premise ID	8851805893

	Month												Totals / *Averages*
	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	
Notified Max Demand	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	***47,000***
Utilized Capacity	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	47,000.00	***47,000.00***
CONSUMPTION DETAILS													
ENERGY CONSUMPTION OFF PEAK kWH	5,079,768.84	5,655,926.52	5,547,622.50	5,799,046.50	7,740,054.00	7,518,303.00	6,639,201.54	1,827,280.26	6,184,017.58	7,828,512.26	5,664,027.85	6,062,004.00	**71,545,764.85**
ENERGY CONSUMPTION STD kWh	6,200,036.46	5,437,242.27	6,289,011.00	6,450,444.00	4,957,002.00	6,584,197.50	5,875,279.38	1,849,180.86	6,678,568.61	5,817,595.66	6,071,152.34	6,694,299.00	**68,904,009.08**
ENERGY CONSUMPTION PEAK kWh	2,837,722.50	2,384,108.82	2,773,944.00	2,783,952.00	1,826,280.00	2,791,012.50	2,396,727.18	755,961.66	2,694,422.54	1,997,116.44	2,570,575.50	2,997,558.00	**28,809,381.14**
ENERGY CONSUMPTION ALL kWh	14,117,527.80	13,477,277.61	14,610,577.50	15,033,442.50	14,523,336.00	16,893,513.00	14,911,208.10	4,432,422.78	15,557,008.73	15,643,224.36	14,305,755.69	15,753,861.00	**169,259,155.07**
DEMAND CONSUMPTION - OFF PEAK	29,183.67	44,039.88	35,767.12	28,473.81	34,662.86	35,987.18	31,095.79	8,517.60	25,823.24	31,252.60	37,133.16	33,596.22	**375,533.13**
DEMAND CONSUMPTION - STD	30,347.78	32,064.79	33,592.34	32,459.68	35,767.12	34,405.89	34,685.98	9,455.40	31,006.35	31,381.87	36,368.18	33,877.40	**375,412.78**
DEMAND CONSUMPTION - PEAK	33,991.53	34,508.41	34,662.86	33,263.08	31,084.72	34,926.62	34,543.53	9,034.20	30,126.09	32,336.00	36,316.15	38,695.17	**383,488.36**
DEMAND READING - KW/KVA	33,991.53	34,508.42	34,662.86	33,263.08	35,767.13	34,926.62	34,685.98	9,455.40	31,006.36	32,336.01	36,368.19	38,695.17	**389,666.75**
REACTIVE ENERGY - OFF PEAK	1,450,449.72	5,602,220.00	1,419,660.00	1,551,330.00	1,857,802.50	2,150,973.00	1,787,751.36	0.00	1,403,771.90	1,777,072.21	1,114,010.53	1,491,565.50	**21,606,606.72**
REACTIVE ENERGY - STD	1,870,567.02	600,420.00	1,674,607.50	1,807,240.50	1,318,171.50	1,954,174.50	1,736,014.50	0.00	1,516,035.10	1,320,594.16	1,139,169.67	1,770,912.00	**16,707,906.45**
REACTIVE ENERGY - PEAK	738,880.92	211,860.00	661,554.00	714,397.50	531,522.00	773,554.50	661,050.00	0.00	611,633.94	453,345.43	437,463.00	662,571.00	**6,457,832.29**
EXCESS REACTIVE ENERGY	98,302.34	99,655.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25,011.00	**222,969.21**
LOAD FACTOR	57.00	41.00	57.00	62.00	57.00	64.00	59.00	69.00	69.00	68.00	52.00	57.00	***59.33***
CHARGES DETAILS													
Administration Charge @ R147.34 per day for monthdays	R 4,567.54	R 4,567.54	R 4,420.20	R 4,567.54	R 4,420.20	R 4,567.54	R 4,567.54	R 4,125.52	R 4,567.54	R 4,420.20	R 4,567.54	R 4,420.20	**R 53,779.10**
TX Network Capacity Charge R9.54/kVA	R 448,380.00	R 448,380.00	R 448,380.00	R 448,380.00	R 448,380.00	R 448,380.00	R 448,380.00	R 448,380.00	R 448,380.00	R 448,380.00	R 448,380.00	R 448,380.00	**R 5,380,560.00**
Network Capacity Charge R18.90/kVA	R 888,300.00	R 888,300.00	R 888,300.00	R 888,300.00	R 888,300.00	R 888,300.00	R 888,300.00	R 888,300.00	R 888,300.00	R 888,300.00	R 888,300.00	R 888,300.00	**R 10,659,600.00**
Network Demand Charge R35.83 /kVA	R 1,217,916.52	R 1,236,436.69	R 1,241,970.27	R 1,191,816.16	R 1,281,536.27	R 1,251,420.79	R 1,242,798.66	R 338,786.98	R 1,110,957.88	R 1,158,599.24	R 1,303,072.25	R 1,386,447.94	**R 13,961,759.65**
Ancillary Service Charge @ R0.0047 /kWh	R 66,352.38	R 63,343.21	R 68,669.72	R 70,657.18	R 68,259.68	R 79,399.51	R 70,082.68	R 20,832.39	R 73,117.94	R 73,523.15	R 67,237.05	R 74,043.15	**R 795,518.04**
High Season Off Peak Energy Charge @ R0.6068 /kWh	R 3,082,403.83	R 3,432,016.50	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 3,678,424.03	**R 10,192,844.36**
Low Season Off Peak Energy Charge @ R0.5253 /kWh			R 2,914,166.36	R 3,046,239.39	R 4,065,850.37	R 3,949,364.57	R 3,487,572.81	R 959,870.18	R 3,248,464.66	R 4,112,317.35	R 2,975,313.91	R -	**R 28,759,159.60**
High Season Peak Energy Charge @ R3.6885 / kWh	R 10,466,941.29	R 8,793,786.05	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 11,056,492.68	**R 30,317,220.02**
Low Season Peak Energy Charge @ R1.2034 / kWh			R 3,338,164.21	R 3,350,207.84	R 2,197,745.35	R 3,358,705.04	R 2,884,221.27	R 909,724.67	R 3,242,468.64	R 2,403,329.39	R 3,093,431.16	R -	**R 24,777,997.58**
High Season Standard Energy Charge @ R1.1174 /kWh	R 6,927,920.23	R 6,075,574.21		R -	R -	R -	R -	R -	R -	R -	R -	R 7,480,209.70	**R 20,483,704.14**
Low Season Standard Energy Charge @ R0.8282 /kWh			R 5,208,558.91	R 5,342,257.72	R 4,105,389.06	R 5,453,032.78	R 4,865,906.07	R 1,531,491.70	R 5,531,190.85	R 4,818,133.01	R 5,028,128.09	R -	**R 41,884,088.18**
Electrification and Rural Subsidy @ R0.0917 /kWh	R 1,294,577.32	R 1,235,866.39	R 1,339,790.00	R 1,378,566.72	R 1,331,789.91	R 1,549,135.14	R 1,367,357.77	R 406,453.19	R 1,426,577.73	R 1,434,483.64	R 1,311,837.83	R 1,444,629.05	**R 15,521,064.70**
High Season Reactive energy Charge @ R0.1656 /kvarh	R 16,278.81	R 16,503.03	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 4,141.82	**R 36,923.67**
Service Charge	R 143,024.39	R 143,024.39	R 138,410.70	R 143,024.39	R 138,410.70	R 143,024.39	R 143,024.39	R 129,183.32	R 143,024.39	R 138,410.70	R 143,024.39	R 138,410.70	**R 1,683,996.85**
Total Charges	**R 24,556,662.31**	**R 22,337,798.01**	**R 15,590,830.37**	**R 15,864,016.94**	**R 14,530,081.54**	**R 17,125,329.76**	**R 15,402,211.19**	**R 5,637,147.95**	**R 16,117,049.63**	**R 15,479,896.68**	**R 15,263,292.22**	**R 26,603,899.27**	**R 202,824,219.02**
Consumption Charges	R 20,477,265.34	R 18,301,376.76	R 11,460,889.48	R 11,738,704.95	R 10,368,984.77	R 12,761,102.39	R 11,237,700.15	R 3,401,086.56	R 12,022,124.14	R 11,333,779.76	R 11,096,873.15	R 22,215,126.41	**R 156,415,013.87**
Ancillary Charges	R 4,079,396.97	R 4,036,421.25	R 4,129,940.89	R 4,125,311.99	R 4,161,096.77	R 4,364,227.37	R 4,164,511.04	R 2,236,061.39	R 4,094,925.49	R 4,146,116.92	R 4,166,419.07	R 4,388,772.85	**R 46,409,205.15**
Consumption Charges as % of Total Charges	83.39%	81.93%	73.51%	74.00%	71.36%	74.52%	72.96%	60.33%	74.59%	73.22%	72.70%	83.50%	**74.67%**
Ancillary Charges as % of Total Charges	16.61%	16.44%	16.82%	16.80%	16.94%	17.77%	16.96%	9.11%	16.68%	16.88%	16.97%	17.87%	**16.32%**

Combined intake point Eskom summary (3 years)

Intake Point	Combined
Premise ID	5433388634 / 7032344358 / 8851805893

	Month												Totals / *Averages*
	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	
Notified Max Demand	137,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	125,000	152,000	***148,500***
Utilized Capacity	137,000.00	152,000.00	152,000.00	152,000.00	152,000.00	154,829.37	154,829.37	154,829.37	154,829.37	154,829.37	154,829.37	154,829.37	***152,400.47***
CONSUMPTION DETAILS													
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH	23,240,095.90	22,734,732.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23,078,525.46	**69,053,354.23**
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH	0.00	0.00	24,149,153.29	22,151,214.49	22,063,621.21	30,059,955.33	25,071,921.78	22,978,605.46	26,566,125.38	24,622,305.68	23,968,315.88	0.00	
HIGH SEASON ENERGY CONSUMPTION STD kWh	22,924,778.57	23,562,053.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20,786,769.00	**67,273,601.31**
LOW SEASON ENERGY CONSUMPTION STD kWh	0.00	0.00	21,021,374.52	23,896,430.32	22,948,891.22	21,508,844.91	24,396,479.85	22,440,644.65	23,110,365.82	21,620,944.60	23,714,566.90	0.00	
HIGH SEASON ENERGY CONSUMPTION PEAK kWh	9,944,625.48	9,962,447.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8,329,042.54	**28,236,115.90**
LOW SEASON ENERGY CONSUMPTION PEAK kWh	0.00	0.00	8,396,059.92	10,287,407.46	9,839,074.74	8,353,381.08	10,022,740.63	9,134,119.94	9,454,937.32	9,035,007.32	9,433,583.04	0.00	
ENERGY CONSUMPTION ALL kWh	56,109,499.95	56,259,234.49	53,566,587.73	56,335,052.27	54,851,587.17	59,922,181.32	59,491,142.26	54,553,370.05	59,131,428.52	55,278,257.60	57,116,465.82	52,194,337.00	**674,809,144.18**
DEMAND CONSUMPTION - OFF PEAK	104,397.19	107,245.11	102,823.12	107,732.12	102,284.39	111,949.42	113,499.27	119,643.88	114,364.02	115,906.78	108,087.40	105,123.10	**1,313,055.80**
DEMAND CONSUMPTION - STD	107,464.86	111,169.50	106,432.03	114,655.70	121,747.71	122,807.88	114,964.72	117,642.58	123,979.23	116,882.42	117,738.15	106,866.26	**1,382,351.04**
DEMAND CONSUMPTION - PEAK	115,379.33	117,589.01	111,934.45	118,926.43	123,125.17	126,305.35	115,484.31	127,982.45	124,013.09	118,047.67	116,580.26	114,916.41	**1,430,283.93**
DEMAND READING - KW/KVA	116,527.91	118,503.23	112,025.62	119,453.52	124,715.63	126,954.58	116,680.67	129,199.50	126,698.72	119,090.57	117,907.02	115,699.50	**1,443,456.47**
REACTIVE ENERGY - OFF PEAK	7,154,310.60	6,717,780.72	8,045,927.82	7,556,418.00	7,958,554.26	10,388,083.02	8,547,532.02	8,046,395.46	9,153,853.20	8,846,721.48	8,146,538.88	7,048,303.14	**97,610,418.60**
REACTIVE ENERGY - STD	6,933,964.26	7,148,925.78	6,843,194.82	7,974,513.00	7,933,765.50	7,286,178.96	8,281,691.78	7,815,750.00	7,895,316.84	7,489,785.12	7,746,044.40	6,350,955.54	**89,700,086.00**
REACTIVE ENERGY - PEAK	2,661,559.22	2,693,010.60	2,529,601.56	3,249,839.14	3,205,570.80	2,696,230.56	3,252,792.14	3,023,407.74	3,091,310.42	2,961,146.46	2,898,952.38	2,266,180.08	**34,529,601.10**
EXCESS REACTIVE ENERGY	689,895.30	651,450.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	752,644.38	**2,093,989.73**
LOAD FACTOR	65.67	63.00	68.33	62.67	60.33	64.33	70.00	64.00	63.33	63.33	66.33	65.00	***64.69***
CHARGES DETAILS													
Administration Charge @ R147.34 per day for monthdays	R 11,085.60	R 11,085.60	R 10,728.00	R 11,085.60	R 10,728.00	R 11,085.60	R 11,085.60	R 10,012.80	R 11,085.60	R 10,728.00	R 11,085.60	R 10,728.00	**R 130,524.00**
TX Network Capacity Charge R9.54/kVA	R 1,056,270.00	R 1,171,920.00	R 1,171,920.00	R 1,171,920.00	R 1,171,920.00	R 1,193,734.44	R 1,193,734.44	R 1,193,734.44	R 1,193,734.44	R 1,193,734.44	R 1,193,734.44	R 1,193,734.44	**R 14,100,091.10**
Network Capacity Charge R18.90/kVA	R 2,094,730.00	R 2,324,080.00	R 2,324,080.00	R 2,324,080.00	R 2,324,080.00	R 2,367,341.07	R 2,367,341.07	R 2,367,341.07	R 2,367,341.07	R 2,367,341.07	R 2,367,341.07	R 2,367,341.07	**R 27,962,437.47**
Excess Network Capacity Charge 8,776.23 kVa @ R26.60	R -	R -	R -	R -	R -	R 65,075.74	R -	R -	R 105,536.42	R -	R -	R -	
Network Demand Charge R35.83 /kVA	R 3,378,144.11	R 3,435,408.64	R 3,247,622.72	R 3,462,957.54	R 3,615,506.11	R 3,680,413.27	R 3,382,572.62	R 3,745,493.51	R 3,672,995.89	R 3,452,435.62	R 3,418,124.51	R 3,354,128.51	**R 41,845,803.07**
Ancillary Service Charge @ R0.0047 /kWh	R 213,216.10	R 213,785.09	R 203,553.03	R 214,073.20	R 208,436.03	R 227,704.29	R 226,066.34	R 207,302.81	R 224,699.43	R 210,057.38	R 217,042.57	R 198,338.48	**R 2,564,274.75**
High Season Off Peak Energy Charge @ R0.6068 /kWh	R 11,408,563.13	R 11,160,480.43	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 11,329,247.92	**R 33,898,291.48**
Low Season Off Peak Energy Charge @ R0.5253 /kWh	R -	R -	R 10,263,390.03	R 9,414,266.38	R 9,377,038.93	R 12,775,480.88	R 10,655,566.85	R 9,765,907.13	R 11,290,603.13	R 10,464,480.05	R 10,186,534.30	R -	**R 94,193,267.65**
High Season Peak Energy Charge @ R3.6885 / kWh	R 20,724,000.22	R 21,300,096.82	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 18,791,239.18	**R 60,815,336.21**
Low Season Peak Energy Charge @ R1.2034 / kWh	R -	R -	R 14,084,320.58	R 16,010,608.77	R 15,375,756.97	R 14,410,926.15	R 16,345,641.60	R 15,035,231.48	R 15,483,945.22	R 14,486,033.15	R 15,888,759.89	R -	**R 137,121,223.81**
High Season Standard Energy Charge @ R1.1174 /kWh	R 29,674,761.00	R 29,727,941.85	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 24,853,864.31	**R 84,256,567.16**
Low Season Standard Energy Charge @ R0.8282 /kWh	R -	R -	R 8,173,564.41	R 10,014,790.71	R 9,578,338.54	R 8,132,016.40	R 9,757,138.36	R 8,892,065.82	R 9,204,381.17	R 8,795,579.31	R 9,183,593.05	R -	**R 81,731,467.79**
Electrification and Rural Subsidy @ R0.0917 /kWh	R 4,163,324.90	R 4,174,435.24	R 3,974,640.83	R 4,180,060.86	R 4,069,987.76	R 4,446,225.83	R 4,414,242.74	R 4,047,860.05	R 4,387,551.96	R 4,101,646.74	R 4,238,041.78	R 3,872,819.81	**R 50,070,838.48**
High Season Reactive energy Charge @ R0.1656 /kvarh	R 92,446.06	R 87,294.30	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 100,854.30	**R 280,594.66**
Service Charge	R 115,707.81	R 115,707.81	R 111,975.30	R 115,707.81	R 111,975.30	R 115,707.81	R 115,707.81	R 104,510.28	R 115,707.81	R 111,975.30	R 115,707.81	R 111,975.30	**R 1,362,366.15**
Total Charges	**R 72,932,248.94**	**R 73,722,235.77**	**R 43,565,794.91**	**R 46,919,550.87**	**R 45,843,767.65**	**R 47,425,711.49**	**R 48,469,097.44**	**R 45,369,459.36**	**R 48,057,582.13**	**R 45,194,011.07**	**R 46,819,965.02**	**R 66,184,271.30**	**R 628,970,717.62**
Consumption Charges	R 61,807,324.34	R 62,188,519.09	R 32,521,275.02	R 35,439,665.86	R 34,331,134.43	R 35,318,423.43	R 36,758,346.81	R 33,693,204.43	R 35,978,929.51	R 33,746,092.51	R 35,258,887.24	R 54,974,351.41	**R 492,016,154.09**
Ancillary Charges	R 11,124,924.59	R 11,533,716.68	R 11,044,519.90	R 11,479,885.01	R 11,512,633.22	R 12,107,288.06	R 11,710,750.63	R 11,676,254.94	R 12,078,652.62	R 11,447,918.56	R 11,561,077.78	R 11,209,919.89	**R 136,954,563.53**
Consumption Charges as % of Total Charges	84.75%	84.36%	74.65%	75.53%	74.89%	74.47%	75.84%	74.26%	74.87%	74.67%	75.31%	83.06%	**77.22%**
Ancillary Charges as % of Total Charges	15.25%	15.64%	25.35%	24.47%	25.11%	25.53%	24.16%	25.74%	25.13%	25.33%	24.69%	16.94%	**22.78%**

Intake Point	Combined
Premise ID	5433388634 / 7032344358 / 8851805893

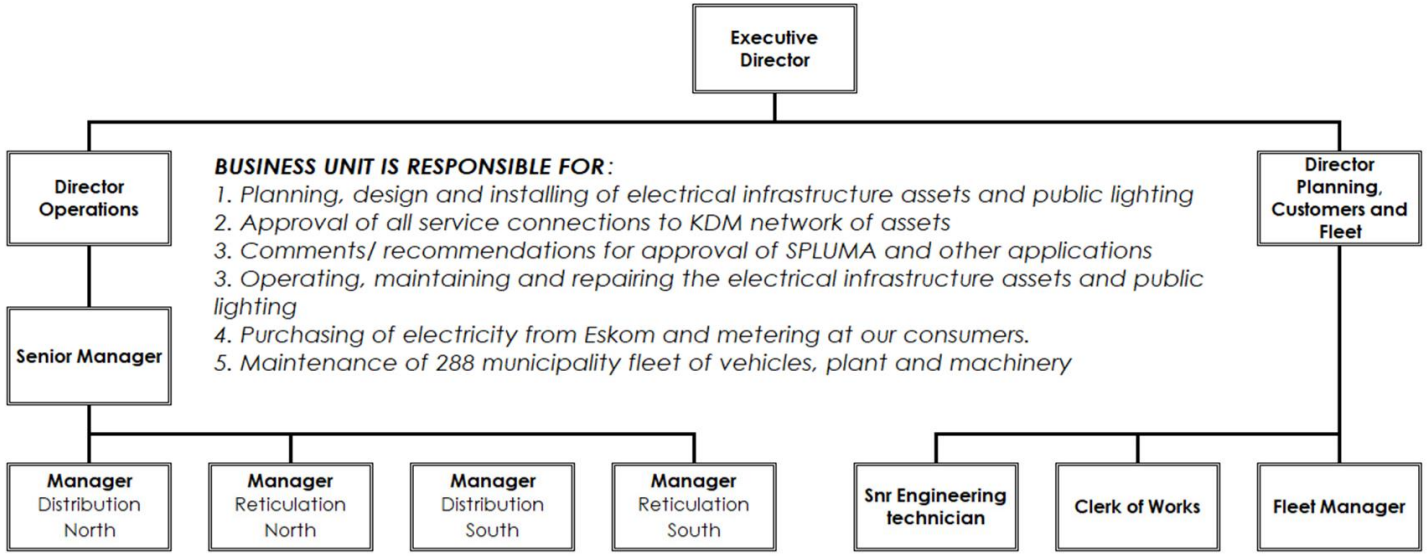
	Month												Totals / *Averages*
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	
Notified Max Demand	152,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	125,000	152,000	*149,750*
Utilized Capacity	154,829.37	154,829.37	154,829.37	154,829.37	154,829.37	156,388.11	156,388.11	156,388.11	156,388.11	156,388.11	156,388.11	156,388.11	*155,738.64*
CONSUMPTION DETAILS													
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH	22,113,414.28	23,395,868.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21,536,802.84	**67,046,085.78**
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH	0.00	0.00	23,486,418.42	22,358,503.20	23,359,014.47	28,468,239.60	25,586,852.88	23,176,325.28	24,786,243.90	21,094,742.64	20,571,671.10	0.00	
HIGH SEASON ENERGY CONSUMPTION STD kWh	23,941,380.92	23,240,830.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22,105,818.90	**69,288,030.26**
LOW SEASON ENERGY CONSUMPTION STD kWh	0.00	0.00	21,904,003.66	23,390,510.41	23,595,384.53	21,532,525.68	24,368,818.02	21,955,020.36	23,318,172.42	16,942,137.96	18,598,199.52	0.00	
HIGH SEASON ENERGY CONSUMPTION PEAK kWh	10,537,110.32	9,532,297.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9,154,769.64	**29,224,177.00**
LOW SEASON ENERGY CONSUMPTION PEAK kWh	0.00	0.00	9,057,218.12	10,234,220.31	9,503,403.76	8,040,649.14	9,978,454.86	8,841,837.30	9,822,077.82	6,741,441.72	7,378,664.58	0.00	
ENERGY CONSUMPTION ALL kWh	56,591,905.52	56,168,996.14	54,447,640.20	55,983,233.92	56,457,802.76	58,041,414.42	59,934,125.76	53,973,182.94	57,926,494.14	44,778,322.32	46,548,535.20	52,797,391.38	**653,649,044.70**
DEMAND CONSUMPTION - OFF PEAK	108,437.54	110,501.27	105,772.27	104,770.37	106,706.23	109,773.64	115,384.50	119,447.70	112,038.88	98,872.69	106,299.24	107,341.50	**1,305,345.83**
DEMAND CONSUMPTION - STD	111,267.81	115,257.61	116,211.50	109,467.18	118,698.74	126,858.26	121,264.95	123,591.08	118,262.84	101,010.83	112,386.15	111,115.55	**1,385,392.50**
DEMAND CONSUMPTION - PEAK	115,967.67	121,017.82	116,953.60	112,748.32	117,845.51	124,205.22	124,430.08	121,958.24	128,787.10	97,884.36	105,620.97	116,670.29	**1,404,089.18**
DEMAND READING - KW/KVA	117,386.10	121,960.06	117,263.59	113,944.08	120,116.52	130,861.42	125,812.45	125,859.98	128,787.10	103,118.86	112,427.45	116,928.84	**1,434,466.45**
REACTIVE ENERGY - OFF PEAK	6,955,736.48	7,471,018.74	8,437,344.30	6,681,111.17	7,271,158.01	9,313,604.94	9,144,022.26	8,176,573.26	8,239,577.58	6,765,045.00	6,380,464.14	5,979,574.62	**90,815,230.50**
REACTIVE ENERGY - STD	7,487,979.90	7,140,105.36	7,483,188.12	6,891,192.89	7,335,897.69	6,714,816.66	8,808,639.06	7,612,851.24	7,594,136.64	5,009,318.22	5,362,254.72	5,926,864.02	**83,367,244.52**
REACTIVE ENERGY - PEAK	2,883,523.14	2,605,155.54	2,919,387.48	2,822,808.60	2,812,413.46	2,410,882.44	3,464,578.26	2,951,314.32	3,007,423.20	1,925,087.22	2,003,195.58	2,209,013.16	**32,014,782.40**
EXCESS REACTIVE ENERGY	959,696.33	857,464.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	181,068.93	**1,998,229.43**
LOAD FACTOR	66.00	63.33	66.00	66.33	66.00	59.67	65.33	62.33	61.00	64.00	56.00	63.67	*63.31*
CHARGES DETAILS													
Administration Charge @ R147.34 per day for monthdays	R 12,818.19	R 12,818.19	R 12,404.70	R 12,818.19	R 12,404.70	R 12,818.19	R 12,818.19	R 11,991.21	R 12,818.19	R 12,404.70	R 12,818.19	R 12,404.70	**R 151,337.34**
TX Network Capacity Charge R9.54/kVA	R 1,381,077.98	R 1,381,077.98	R 1,381,077.98	R 1,381,077.98	R 1,381,077.98	R 1,394,981.94	R 1,394,981.94	R 1,394,981.94	R 1,394,981.94	R 1,394,981.94	R 1,394,981.94	R 1,394,981.94	**R 16,670,263.49**
Network Capacity Charge R18.90/kVA	R 2,737,383.26	R 2,737,383.26	R 2,737,383.26	R 2,737,383.26	R 2,737,383.26	R 2,764,941.78	R 2,764,941.78	R 2,764,941.78	R 2,764,941.78	R 2,764,941.78	R 2,764,941.78	R 2,764,941.78	**R 33,041,508.80**
Excess Network Capacity Charge 8,776.23 kVa @ R26.60	R -	R -	R -	R -	R -	R 233,447.72	R -	R -	R -	R -	R -	R -	
Network Demand Charge R35.83 /kVA	R 3,934,782.07	R 4,088,101.21	R 3,930,675.54	R 3,819,405.56	R 4,026,305.75	R 4,386,474.80	R 4,217,233.32	R 4,218,826.53	R 4,316,943.59	R 3,456,544.19	R 3,768,568.12	R 3,919,454.72	**R 48,083,315.40**
Ancillary Service Charge @ R0.0047 /kWh	R 249,004.38	R 247,143.58	R 239,569.62	R 246,326.23	R 248,414.33	R 255,382.22	R 263,710.15	R 237,482.01	R 254,876.57	R 197,024.62	R 204,813.55	R 232,308.52	**R 2,876,055.80**
High Season Off Peak Energy Charge @ R0.6068 /kWh	R 12,551,573.79	R 13,279,495.24	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 12,224,289.38	**R 38,055,358.41**
Low Season Off Peak Energy Charge @ R0.5253 /kWh	R -	R -	R 11,541,225.81	R 10,986,968.37	R 11,478,619.48	R 13,989,292.64	R 12,573,379.56	R 11,388,846.11	R 12,179,960.30	R 10,365,956.71	R 10,108,919.13	R -	**R 104,613,168.11**
High Season Peak Energy Charge @ R3.6885 / kWh	R 25,025,925.56	R 24,293,640.64	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 23,107,212.60	**R 72,426,778.80**
Low Season Peak Energy Charge @ R1.2034 / kWh	R -	R -	R 16,969,031.90	R 18,120,628.87	R 18,279,344.76	R 16,681,247.89	R 18,878,523.30	R 17,008,553.99	R 18,064,588.62	R 13,125,074.31	R 14,408,025.54	R -	**R 151,535,019.19**
High Season Standard Energy Charge @ R1.1174 /kWh	R 36,357,244.34	R 32,890,241.02	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 31,587,614.96	**R 100,835,100.32**
Low Season Standard Energy Charge @ R0.8282 /kWh	R -	R -	R 10,195,710.30	R 11,520,661.45	R 10,697,981.88	R 9,051,358.58	R 11,232,746.79	R 9,953,257.04	R 11,056,713.20	R 7,588,841.26	R 8,306,162.06	R -	**R 89,603,432.58**
Electrification and Rural Subsidy @ R0.0917 /kWh	R 4,855,585.45	R 4,819,299.86	R 4,671,607.60	R 4,803,361.48	R 4,844,079.50	R 4,979,953.32	R 5,142,348.01	R 4,630,899.10	R 4,970,093.19	R 3,841,980.11	R 3,993,864.30	R 4,530,016.15	**R 56,083,088.06**
High Season Reactive energy Charge @ R0.1656 /kvarh	R 148,656.91	R 132,821.17	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 28,047.59	**R 309,525.67**
Service Charge	R 133,792.59	R 133,792.59	R 129,476.70	R 133,792.59	R 129,476.70	R 133,792.59	R 133,792.59	R 125,160.81	R 133,792.59	R 129,476.70	R 133,792.59	R 129,476.70	**R 1,579,615.74**
Total Charges	**R 87,387,844.54**	**R 84,015,814.75**	**R 51,808,163.41**	**R 53,762,423.99**	**R 53,835,088.36**	**R 53,883,691.69**	**R 56,614,475.67**	**R 51,734,940.50**	**R 55,149,709.99**	**R 42,877,226.33**	**R 45,096,887.22**	**R 79,930,749.03**	**R 714,283,951.99**
Consumption Charges	R 73,934,743.69	R 70,463,376.91	R 38,705,968.01	R 40,628,258.70	R 40,455,946.12	R 39,721,899.12	R 42,684,649.66	R 38,350,657.14	R 41,301,262.13	R 31,079,872.28	R 32,823,106.73	R 66,919,116.94	**R 557,068,857.42**
Ancillary Charges	R 13,453,100.85	R 13,552,437.85	R 13,102,195.41	R 13,134,165.29	R 13,379,142.24	R 14,161,792.58	R 13,929,826.01	R 13,384,283.36	R 13,848,447.86	R 11,797,354.05	R 12,273,780.49	R 13,011,632.09	**R 157,215,094.57**
Consumption Charges as % of Total Charges	84.61%	83.87%	74.71%	75.57%	75.15%	73.72%	75.40%	74.13%	74.89%	72.49%	72.78%	83.72%	**76.75%**
Ancillary Charges as % of Total Charges	15.39%	16.13%	25.29%	24.43%	24.85%	26.28%	24.60%	25.87%	25.11%	27.51%	27.22%	16.28%	**23.25%**

Intake Point	Combined												
Premise ID	5433388634 / 7032344358 / 8851805893												
	Month												Totals / *Averages*
	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	
Notified Max Demand	152,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	152,000	*152,000*
Utilized Capacity	156,388.11	156,388.11	156,388.11	156,388.11	156,388.11	152,000.00	152,000.00	152,000.00	152,000.00	152,000.00	152,000.00	152,000.00	*153,828.38*
CONSUMPTION DETAILS													
ENERGY CONSUMPTION OFF PEAK kWH	21,013,208.52	22,155,680.28	22,410,382.02	21,991,880.58	25,620,120.00	28,040,781.24	26,476,200.42	18,635,075.46	24,345,496.30	27,254,832.74	23,520,564.49	23,079,036.48	**284,543,258.53**
ENERGY CONSUMPTION STD kWh	23,379,812.22	20,050,662.27	22,287,677.88	23,249,951.04	21,442,400.88	24,130,785.18	22,402,192.98	18,205,218.30	24,558,647.33	21,628,168.78	22,295,591.54	23,093,627.16	**266,724,735.56**
ENERGY CONSUMPTION PEAK kWh	10,258,729.62	8,281,453.62	9,588,900.00	9,688,764.00	8,613,962.64	9,992,454.42	8,905,669.26	7,247,256.54	9,901,891.82	8,285,994.36	9,259,370.70	9,883,443.60	**109,907,890.58**
ENERGY CONSUMPTION ALL kWh	54,651,750.36	50,487,796.17	54,286,959.90	54,930,595.62	55,676,483.52	62,164,020.84	57,784,062.66	44,087,550.30	58,806,035.45	57,168,995.88	55,075,526.73	56,056,107.24	**661,175,884.67**
DEMAND CONSUMPTION - OFF PEAK	109,676.70	123,457.15	111,154.53	103,894.27	109,569.89	119,724.29	107,812.58	88,265.72	110,388.79	111,915.53	112,076.77	112,466.67	**1,320,402.89**
DEMAND CONSUMPTION - STD	114,703.29	114,308.92	120,497.20	114,470.45	116,334.26	123,813.31	120,365.65	94,705.43	116,527.11	114,343.19	118,835.28	118,249.46	**1,387,153.55**
DEMAND CONSUMPTION - PEAK	118,071.65	117,763.28	124,059.81	117,703.02	112,620.34	124,395.41	118,575.70	95,754.99	120,646.40	116,402.11	117,075.59	127,488.94	**1,410,557.24**
DEMAND READING - KW/KVA	122,269.33	120,718.34	124,454.54	117,739.49	117,955.68	124,870.78	120,365.66	96,176.20	121,526.68	116,714.69	118,835.29	127,488.95	**1,429,115.63**
REACTIVE ENERGY - OFF PEAK	5,589,896.28	15,539,865.76	6,138,273.12	6,075,118.80	7,393,647.30	8,829,243.24	7,704,469.92	5,274,364.80	7,464,991.10	8,204,352.37	6,334,838.53	6,106,234.62	**90,655,295.84**
REACTIVE ENERGY - STD	6,041,545.26	34,573,561.92	5,876,920.62	6,497,019.54	6,427,442.70	7,517,975.94	6,704,290.02	5,152,752.48	7,288,532.86	6,508,234.96	37,066,136.71	6,123,694.56	**135,778,107.57**
REACTIVE ENERGY - PEAK	2,393,306.04	1,687,938.24	2,349,049.68	2,557,069.98	16,529,155.76	2,965,727.94	2,545,126.80	1,942,520.64	2,831,650.26	2,415,902.71	2,309,867.64	2,302,083.00	**42,829,398.69**
EXCESS REACTIVE ENERGY	137,657.78	505,967.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93,441.52	**737,066.67**
LOAD FACTOR	178.00	160.00	180.00	190.00	198.00	201.00	195.00	206.00	201.00	209.00	186.00	181.00	***190.42***
CHARGES DETAILS													
Administration Charge @ R147.34 per day for monthdays	R 13,702.62	R 13,702.62	R 13,260.60	R 13,702.62	R 13,260.60	R 13,702.62	R 13,702.62	R 12,376.56	R 13,702.62	R 13,260.60	R 13,702.62	R 13,260.60	**R 161,337.30**
TX Network Capacity Charge R9.54/kVA	R 1,491,942.57	R 1,491,942.57	R 1,491,942.57	R 1,491,942.57	R 1,491,942.57	R 1,450,080.00	R 1,450,080.00	R 1,450,080.00	R 1,450,080.00	R 1,450,080.00	R 1,450,080.00	R 1,450,080.00	**R 17,610,272.85**
Network Capacity Charge R18.90/kVA	R 2,955,735.28	R 2,955,735.28	R 2,955,735.28	R 2,955,735.28	R 2,955,735.28	R 2,872,800.00	R 2,872,800.00	R 2,872,800.00	R 2,872,800.00	R 2,872,800.00	R 2,872,800.00	R 2,872,800.00	**R 34,888,276.40**
Network Demand Charge R35.83 /kVA	R 4,380,910.09	R 4,325,338.12	R 4,459,206.17	R 4,218,605.93	R 4,226,352.01	R 4,474,120.05	R 4,312,701.60	R 3,445,993.25	R 4,354,300.94	R 4,181,887.34	R 4,257,868.44	R 4,567,929.08	**R 51,205,213.02**
Ancillary Service Charge @ R0.0047 /kWh	R 256,863.23	R 237,292.65	R 255,148.71	R 258,173.80	R 261,679.47	R 292,170.90	R 271,585.10	R 207,211.49	R 276,388.37	R 268,694.28	R 258,854.98	R 263,463.70	**R 3,107,526.68**
High Season Off Peak Energy Charge @ R0.6068 /kWh	R 12,750,815.22	R 13,444,067.23	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 14,004,359.04	**R 40,199,241.50**
Low Season Off Peak Energy Charge @ R0.5253 /kWh	R -	R -	R 11,772,174.19	R 11,552,335.09	R 13,458,249.04	R 14,729,822.26	R 13,907,948.39	R 9,789,004.90	R 12,788,689.57	R 14,316,963.25	R 12,355,352.79	R -	**R 114,670,539.48**
High Season Peak Energy Charge @ R3.6885 / kWh	R 37,839,325.61	R 30,546,143.08	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 36,455,083.19	**R 104,840,551.88**
Low Season Peak Energy Charge @ R1.2034 / kWh	R -	R -	R 11,539,282.26	R 11,659,458.60	R 10,366,043.07	R 12,024,920.35	R 10,717,082.07	R 8,721,349.07	R 11,915,936.83	R 9,971,365.18	R 11,142,727.06	R -	**R 98,058,164.50**
High Season Standard Energy Charge @ R1.1174 /kWh	R 26,124,601.93	R 22,404,609.72	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 25,804,818.81	**R 74,334,030.46**
Low Season Standard Energy Charge @ R0.8282 /kWh	R -	R -	R 18,458,654.92	R 19,255,609.42	R 17,758,596.51	R 19,985,116.97	R 18,553,496.24	R 15,077,561.55	R 20,339,472.27	R 17,912,449.57	R 18,465,208.47	R -	**R 165,806,165.91**
Electrification and Rural Subsidy @ R0.0917 /kWh	R 5,011,565.57	R 4,629,730.98	R 4,978,114.23	R 5,037,135.65	R 5,105,533.58	R 5,700,440.73	R 5,298,798.58	R 4,042,828.43	R 5,392,513.50	R 5,242,396.93	R 5,050,425.83	R 5,140,345.01	**R 60,629,829.02**
High Season Reactive energy Charge @ R0.1656 /kvarh	R 22,796.00	R 83,788.30	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 15,474.00	**R 122,058.30**
Service Charge	R 143,024.39	R 143,024.39	R 138,410.70	R 143,024.39	R 138,410.70	R 143,024.39	R 143,024.39	R 129,183.32	R 143,024.39	R 138,410.70	R 143,024.39	R 138,410.70	**R 1,683,996.85**
Total Charges	**R 90,991,282.51**	**R 80,275,374.94**	**R 56,061,929.64**	**R 56,585,723.34**	**R 55,775,802.86**	**R 61,686,198.26**	**R 57,541,218.99**	**R 45,748,388.54**	**R 59,546,908.51**	**R 56,368,307.85**	**R 56,010,044.58**	**R 90,726,024.13**	**R 765,633,207.28**
Consumption Charges	R 76,714,742.76	R 66,394,820.03	R 41,770,111.37	R 42,467,403.11	R 41,582,888.62	R 46,739,859.57	R 43,178,526.70	R 33,587,915.52	R 45,044,098.68	R 42,200,778.00	R 41,963,288.32	R 76,264,261.05	**R 597,908,693.72**
Ancillary Charges	R 14,276,539.76	R 13,880,554.91	R 14,291,818.27	R 14,118,320.24	R 14,192,914.24	R 14,946,338.69	R 14,362,692.29	R 12,160,473.02	R 14,502,809.82	R 14,167,529.86	R 14,046,756.25	R 14,461,763.08	**R 167,724,513.56**
Other Charges	**R 500,206.74**	**-R 500,206.74**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
Adjustment - Interest on overdue account	R 235,188.06	-R 235,188.06	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Adjustment - Interest on overdue account	R 148,278.44	-R 148,278.44	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Adjustment - Interest on overdue account	R 45,141.00	-R 45,141.00	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Adjustment - Interest on overdue account	R 71,599.24	-R 71,599.24	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Total Charges before VAT	**R 91,491,489.25**	**R 79,775,168.20**	**R 56,061,929.64**	**R 56,585,723.34**	**R 55,775,802.86**	**R 61,686,198.26**	**R 57,541,218.99**	**R 45,748,388.54**	**R 59,546,908.51**	**R 56,368,307.85**	**R 56,010,044.58**	**R 90,726,024.13**	**R 765,633,207.28**
Consumption Charges as % of Total Charges	84.31%	82.71%	74.51%	75.05%	74.55%	75.77%	75.04%	73.42%	75.64%	74.87%	74.92%	84.06%	**77.07%**
Ancillary Charges as % of Total Charges	15.69%	17.29%	25.49%	24.95%	25.45%	24.23%	24.96%	26.58%	24.36%	25.13%	25.08%	15.94%	**22.93%**

ANNEXURE 3

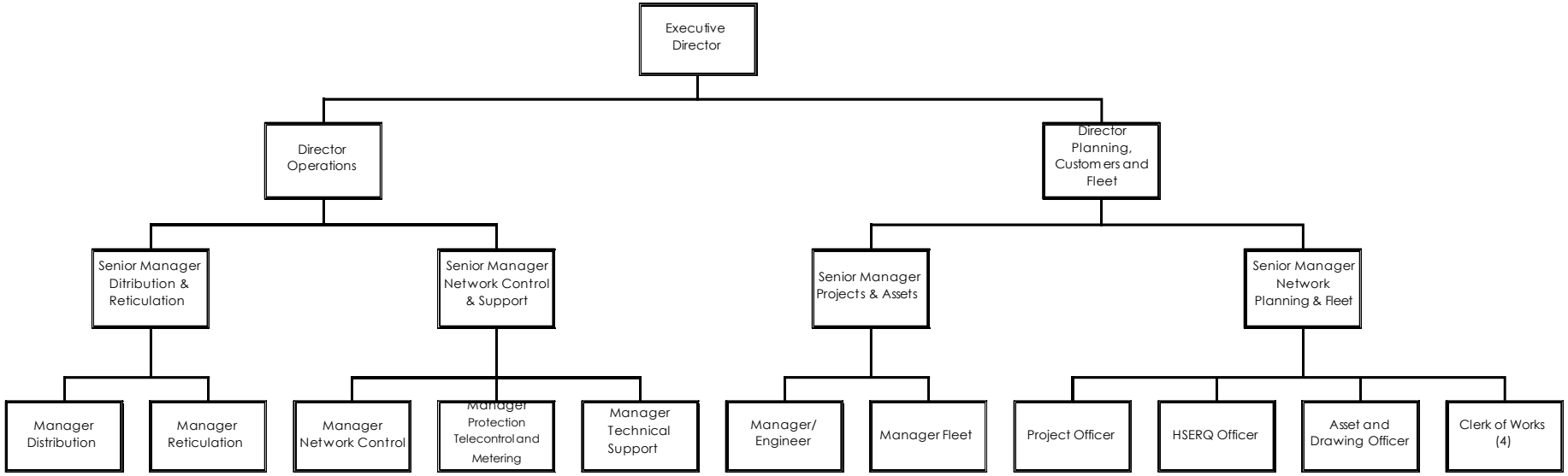
Current & Proposed Organograms

Current Organogram

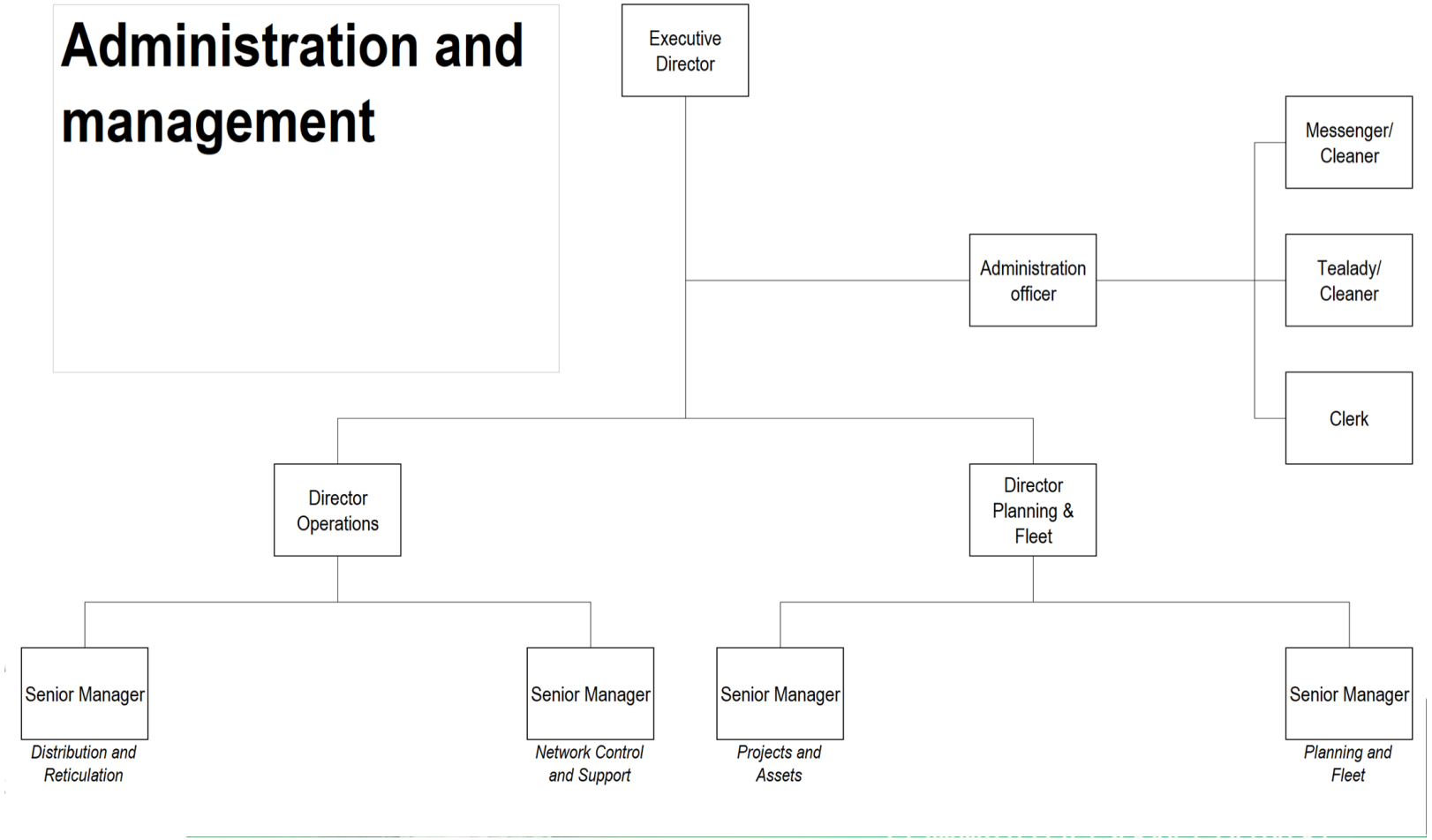


		Filled	Vacant	Filled	Vacant	Filled	Vacant	Filled	Vacant	Filled	Vacant	Filled	Vacant	Filled	Vacant
1	Manager	1	0	0	1	1	0	1	0	0	0	0	0	1	0
2	Technicians/ superintendant	0	0	0	0	0	0	0	0	2	0	1	0	1	0
3	Artisans	6	2	5	1	6	2	5	1	0	0	0	0	3	0
4	Linesman/ senior supervisor	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5	Senior handyman/ streetlight attendant	0	0	0	2	0	0	1	1	0	0	0	0	0	0
6	Senior driver	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7	Artisan assistant/ handman	2	7	2	7	2	7	2	7	0	0	0	0	2	2
8	Control room attendant	6	2	0	0	0	0	0	0	0	0	0	0	0	0
9	Principal clerk	1	0	1	0	1	0	1	0	1	0	0	0	0	0
10	Senior clerk	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11	Messenger	0	0	0	0	0	0	0	0	1	0	0	0	0	0
12	Data capturer	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13	Tyre attendant	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14	General assiostant	6	6	7	6	6	6	6	7	0	0	0	0	4	1

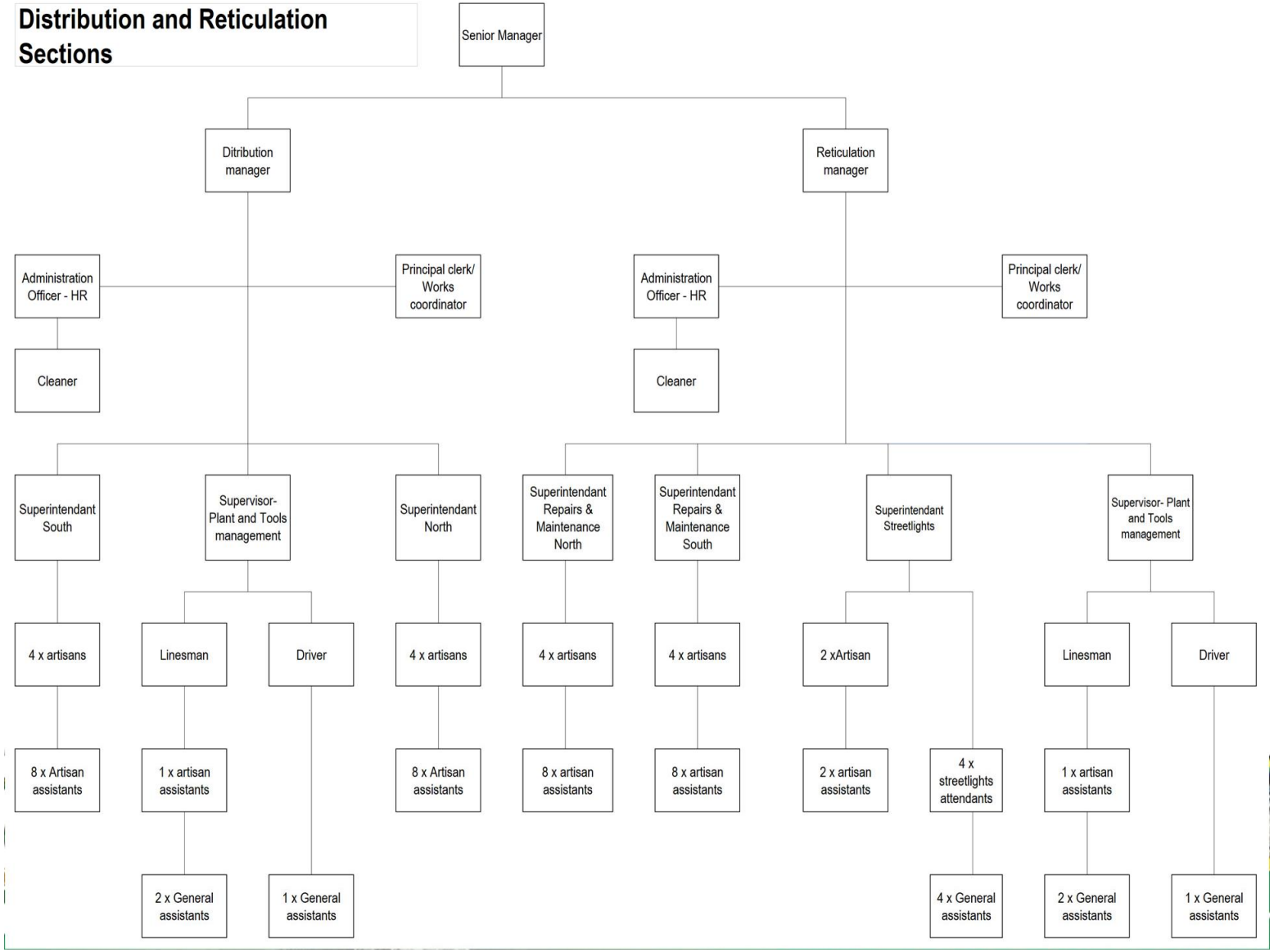
Projected Organogram 2023/2024



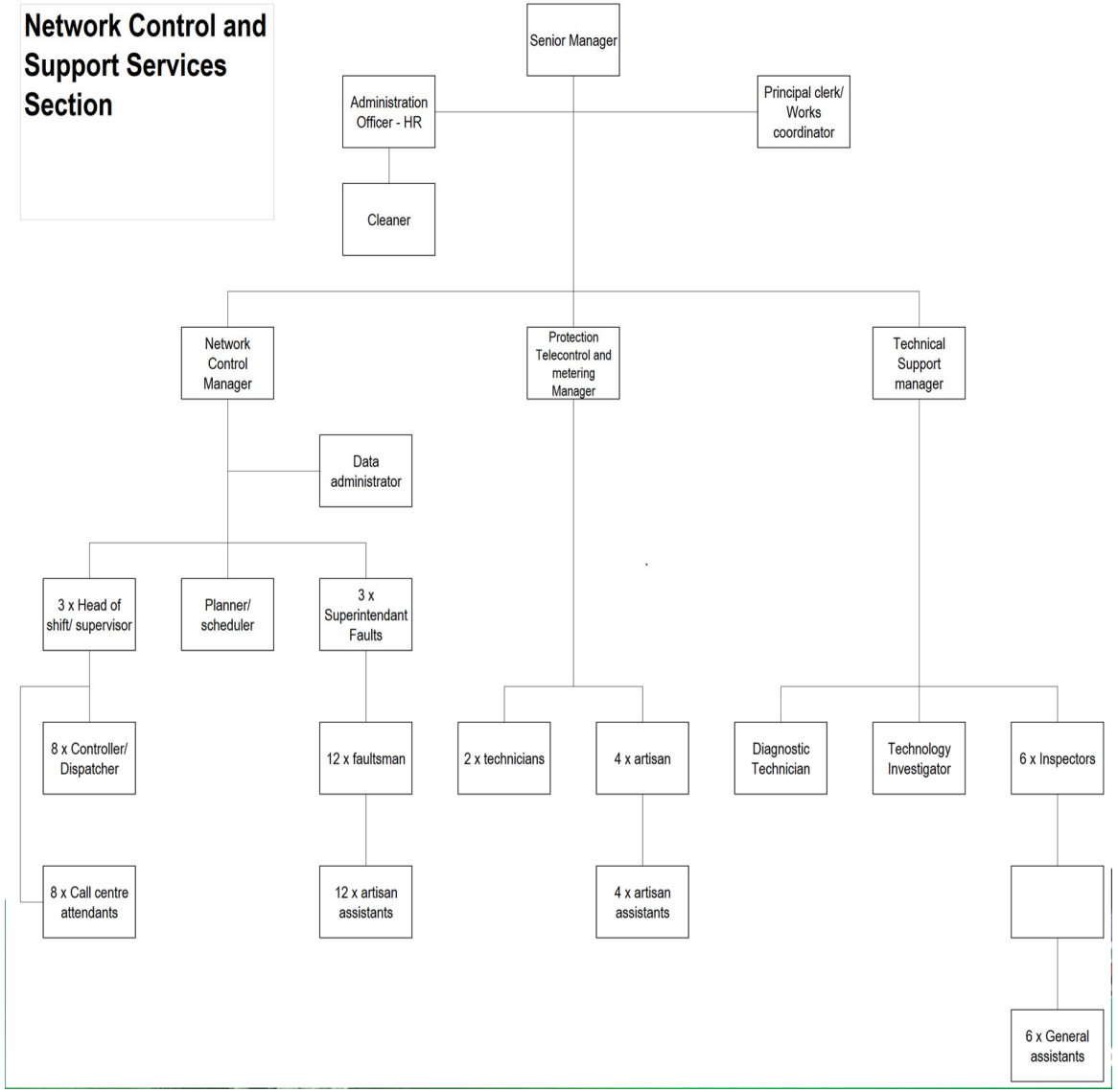
Projected Organogram 2023/2024



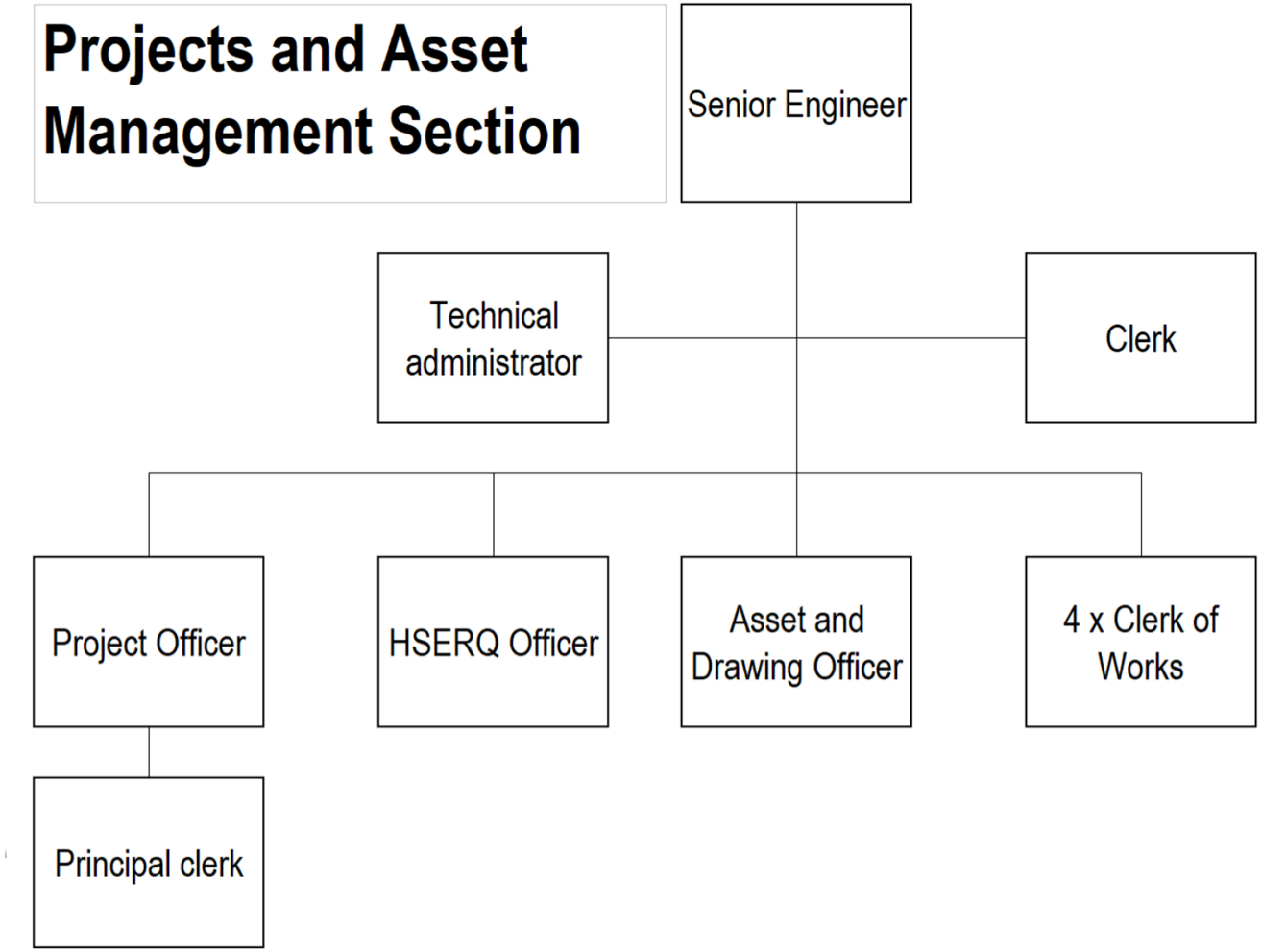
Projected Organogram 2023/2024



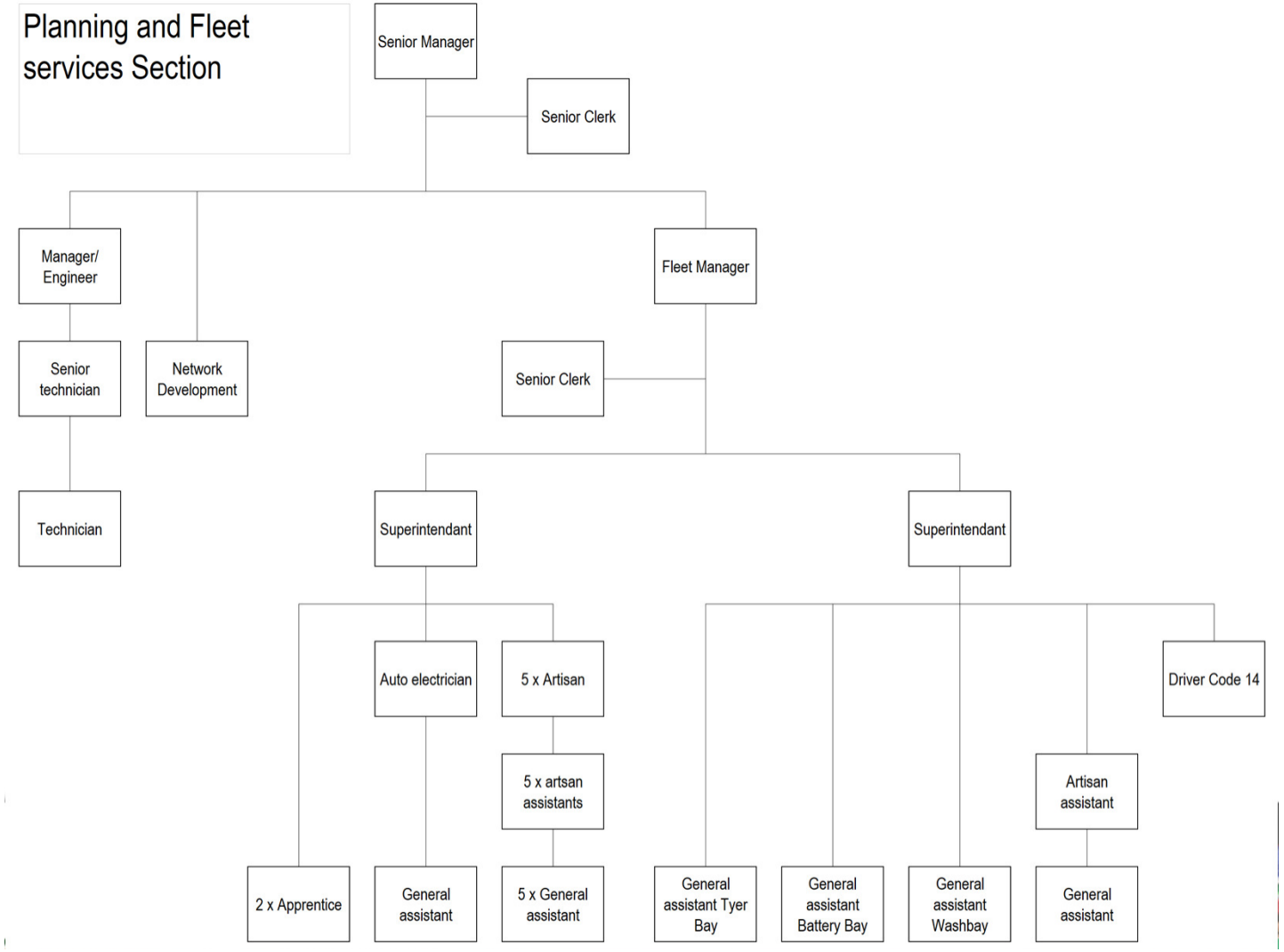
Projected Organogram 2023/2024



Projected Organogram 2023/2024



Projected Organogram 2023/2024



ANNEXURE 4

Electricity Tariff Book 2020/21 & 2021/2022

FINAL TARIFF OF CHARGES

2020/2021

				2020/21 (EXCL VAT)	2020/21 (INCL VAT)	COMMENTS	2019/20 (EXCL VAT)	2019/20 (INCL VAT)	COMMENTS
1. VALUE ADDED TAX MUST BE ADDED TO ALL TARIFFS LISTED BELOW (EXCEPT TO FINES, REFUNDABLE DEPOSITS, INTEREST CHARGES OR WHERE INDICATED AS INCLUSIVE OF VALUE ADDED TAX) 2. ALL APPROVALS OF APPLICATIONS FOR SERVICES LISTED BELOW SHALL BE SUBJECT TO THE APPLICANT OBTAINING A CLEARANCE TO THE EFFECT THAT KWADUKUZA MUNICIPAL ACCOUNTS IN THE NAME OF THE APPLICANT/OWNER ARE NOT IN ARREARS									
A 1	**OUTDOOR ADVERTISING**								
ALL APPLICATIONS SHALL BE IN TERMS OF THE KWADUKUZA MUNICIPALITY'S OUTDOOR ADVERTISING POLICY AND BY-LAWS.									
DISCLAIMER: 1.ALL DISPLAY FEES ARE A MINIMUM CHARGE AND MAY VARY IN TERMS OF PROPOSALS/ AGREEMENTS WITH SERVICE PROVIDERS FROM TIME TO TIME									
DISCLAIMER:2. ALL DISPLAY FEES OWED TO THE KWADUKUZA MUNICIPALITY WILL BE CHARGED AS PER THE TARRIFF STRUCTURE FOR THE SPECIFIC FINANCIAL YEAR.							**NEW**		
DISCLAIMER:3.NO FUTURE APPLICATIONS WILL BE ACCEPTED BY KWADUKUZA MUNICIPALITY FROM APPLICANTS THAT HAVE DEFAULTED IN PAYMENT OF ANNUAL/MONTHLY DISPLAY FEES, AND REFUSE TO SETTLE OUTSTANDING AMOUNTS.							**NEW**		
	(a)		Pre-strutiny for all applications excluding Billboards	**225.22**	**259.00**		**212.17**	**244.00**	
	NON-PERMANENT SIGNS								
	(b)	**General advertisements of both commercial and non-commercial nature:**							
		(i)	Up to 50 posters, or part thereof	**1,295.65**	**1,490.00**		**1,222.61**	**1,406.00**	
		(iii))	Each poster thereafter, an additional	**30.43**	**35.00**		**28.70**	**33.00**	
		(iii)	Refundable deposit (refer to note below)	**500.00**	**500.00**		**500.00**	**500.00**	
	(c)	**General advertisements for non-profit organisations (subject to the submission of an NPO certificate from the relevant authority - eg government)**							
		(aa)	Up to 50 posters, or part thereof						
		(bb)	Each poster thereafter, an additional						

1. VALUE ADDED TAX MUST BE ADDED TO ALL TARIFFS LISTED BELOW (EXCEPT TO FINES, REFUNDABLE DEPOSITS, INTEREST CHARGES OR WHERE INDICATED AS INCLUSIVE OF VALUE ADDED TAX) 2. ALL APPROVALS OF APPLICATIONS FOR SERVICES LISTED BELOW SHALL BE SUBJECT TO THE APPLICANT OBTAINING A CLEARANCE TO THE EFFECT THAT KWADUKUZA MUNICIPAL ACCOUNTS IN THE NAME OF THE APPLICANT/OWNER ARE NOT IN ARREARS				2020/21 (EXCL VAT)	2020/21 (INCL VAT)	COMMENTS	2019/20 (EXCL VAT)	2019/20 (INCL VAT)	COMMENTS
		(iv)	Disposal of special waste generated outside of KDM, per quarter of metric ton	**176.52**	**203.00**				
X1	**SUPPLY OF ELECTRICITY**								
	Designated electrical installations shall mean electrical wiring installations within dwelling units, community halls, or such like public facilities, subsidized by National, Provincial, or Local Government								
X1.1	**INSTALLATION OF ELECTRICITY SERVICES:**								
X1.1.1	(a)		The charges payable to the KwaDukuza Municipality ("KDM") for the "installation" of services shall be as per the tariffs listed hereunder.						
	(b)		Any and all headings used in this section are for convenience only. Although the heading of this section contains the word "Installation", this section does not only deal with installation but contains the KDM's charges for both the provision and installation of electrical and allied services.						
	(c)		All the charges referred to in this section, whether estimated or final, shall be paid to KDM prior to any connection or installation.						
	(d)		All the charges listed hereunder must be paid unless exempted in terms of a written agreement concluded with the municipality.						
	(e)		In the case of a proposed sectional title development, or a proposed share block scheme, or a proposed commercial development, only the registered owner at the time (and not any future owner(s) or "developer") may apply for and be granted electrical services.						
X1.1.2		**Standard Services**							
			Only prepayment or electronic meters with online reading facilities will be installed in farm areas						
X1.1.3		**DEMAND BASED COMPONENT ("DBC")**							
	(a)	(i)	Indigent persons: The DBC charge is not applicable to any dwelling or unit occupied by person(s) registered as being indigent with the KDM / its Council. In the case of dwelling units within which persons registered with Council as being indigent residence, the circuit breaker capacity shall be limited to 20 Ampere Single Phase.						
		(ii)	**NEW Installations (Council Developed)**						
			Low Income Unit						
			Community Residential Unit	**Exempt**	**Exempt**		**Exempt**		
			Social Housing Units	**Exempt**	**Exempt**		**Exempt**		

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			Affordable/ Gap Unit (Approved as FLISP)	**50% OF THE FEES PAID BY NORMAL DEVELOPMENT**	**50% OF THE FEES PAID BY NORMAL DEVELOPMENT**		**50% OF THE FEES PAID BY NORMAL DEVELOPMENT**		
	(b)		Irrespective of any payment made by the developer for the provision of a firm bulk electrical supply in terms of a services agreement entered into between the Municipality and the developer concerned, the DBC charge shall be payable as stated in X1.1.3 (c) below unless exempted by written agreement concluded with KDM.						
	(c)		The DBC charge is levied and payable by and in respect of –						
		(i)	each unit / dwelling / flat on a property (owner occupied or owner let properties);						
		(ii)	each and every unit / dwelling unit / section in a sectional title or shareblock development, irrespective of whether or not there is a change in the erf number.						
	(d)	**The charges for the DBC are-**							
			The charge per kVA applied for as recorded on the official supply application document PER kVA shall be	**R3,895.50**	**R4,479.83**		**R 3,710.00**	**R 4,266.50**	
		(i)	Single phase *60 Amp = 13.8 kVA Load - KVA (admin) = 4.7 kVA*						
			Basic Demand Based Component	**R18,309.26**	**R21,055.65**		**R 17,437.39**	**R 20,053.00**	
			Plus: Complete Service Connection Component including cables etc	**Cost + 10%**	**Cost + 10%**		**Cost + 10%**		
			OR Partial Service connection (Not including cables)	**Cost + 10%**	**Cost + 10%**		**Cost + 10%**		
			Places of worship: (a) 50% rebate be applicable at the time of application						
			(b) Demand contribution is payable over six months without attracting interest						
			(c) The rebate structure is only granted once to a religious organisation						
			(d) Should the premises be sold off at a later stage and should the use of the premises change, the new owner will be compelled to pay in the difference between the full approved tariff of charges at that point in time and what was paid in as a charge at the time of application for electricity by the religious organisation.						
		(ii)	Three Phase *(Maximum 60A) - (1.73x4.7 = 8.131kVA)*						
			Basic Demand Based Component	**R31,674.39**	**R36,425.55**		**R30,166.09**	**R34,691.00**	
			Plus: Complete Service Connection Component including cables etc	**Cost + 10%**	**Cost + 10%**		**Cost + 10%**		
			OR Partial Service connection (Not including cables)	**Cost + 10%**	**Cost + 10%**		**Cost + 10%**		
			Places of worship: (a)75% rebate be applicable at the time of application						
			(b)Demand contribution is payable over six months without attracting interest						

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			(c)The rebate structure is only granted once to a religious organisation						
			(d)Should the premises be sold off at a later stage and should the use of the premises change, the new owner will be compelled to pay in the difference between the full approved tariff of charges at that point in time and what was paid in as a charge at the time of application for electricity by the religious organisation.						
		(iii)	Three Phase *(Maximum 150A) - 1.73x2.5x4.7=20.33kVA)*						
			Basic Demand Based Component	**R79,195.57**	**R91,074.90**		**R 75,424.35**	**R 86,738.00**	
			Plus: Service Connection Component	**Cost + 10%**	**Cost + 10%**		**Cost + 10%**		
			Places of worship: (a)75% rebate be applicable at the time of application						
			(b)Demand contribution is payable over six months without attracting interest						
			(c)The rebate structure is only granted once to a religious organisation						
			(d)Should the premises be sold off at a later stage and should the use of the premises change, the new owner will be compelled to pay in the difference between the full approved tariff of charges at that point in time and what was paid in as a charge at the time of application for electricity by the religious organisation.						
		(iv)	Three Phase (Maximum 80 A) - (1.73x1.33*4.7=10.81)						
			Basic Demand Based Component	**R42,110.48**	**R48,427.05**		**R 40,105.22**	**R 46,121.00**	
			Plus: Complete Service Connection Component including cables etc	**Cost + 10%**	**Cost + 10%**		**Cost + 10%**		
			OR Partial Service connection (Not including cables)	**Cost + 10%**	**Cost + 10%**		**Cost + 10%**		
			Places of worship: (a)75% rebate be applicable at the time of application						
			(b)Demand contribution is payable over six months without attracting interest						
			(c)The rebate structure is only granted once to a religious organisation						
			(d)Should the premises be sold off at a later stage and should the use of the premises change, the new owner will be compelled to pay in the difference between the full approved tariff of charges at that point in time and what was paid in as a charge at the time of application for electricity by the religious organisation.						
		(v)	Basic Demand Based Component for every 3X25A or part thereof (= 17.25kVA) - (1.73x0.42x4.7=3.42)	**R13,323.13**	**R15,321.60**		**R12,688.70**	**R14,592.00**	
			Plus: Service Connection Component	**Cost + 10%**	**Cost + 10%**		**Cost + 10%**		
			Places of worship: (a)75% rebate be applicable at the time of application						
			(b)Demand contribution is payable over six months without attracting interest						
			(c)The rebate structure is only granted once to a religious organisation						

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			(d)Should the premises be sold off at a later stage and should the use of the premises change, the new owner will be compelled to pay in the difference between the full approved tariff of charges at that point in time and what was paid in as a charge at the time of application for electricity by the religious organisation.							
X1.1.4			**Service Connection Component**		**Cost + 10%**	**Cost + 10%**		**Cost + 10%**	**Cost + 10%**	
X1.1.5			**Network connection charge**		**Cost + 10%**	**Cost + 10%**		**Cost + 10%**	**Cost + 1%**	
			The fees calculated must be paid upfront by the developer prior to any electrical supply being made available							
X1.1.6		**Bulk Supplies and Internal Services for Developments**								
		(a)	KDM's charges for bulk supplies and internal services for developments are usually regulated by a written agreement between a party and the KDM in accordance with the Council approved policy in respect of Developer contribution as may be amended from time to time.							
		(b)	The developer / registered owner is liable for all wiring and reticulation costs from any bulk meter to the individual units, and also liable for all "internal" wiring and reticulation costs.							
X1.1.7			Ad Hoc 11kV/420 V Installations for Commercial and Service Industry (excluding residential developments)							
			Basic Demand Based Component …. Per kVA		**R3,895.50**	**R4,479.83**		**R3,710.00**	**R4,266.50**	
			Plus: Service Connection Component As indicated below		**Cost + 10%**	**Cost + 10%**		**Cost + 10%**		
X1.1.8			**General**							
		(a)	Where the requirements of any one or more consumers / Applicant(s) ("consumer") necessitate, in the opinion of the KDM, the specific installation of one or more transformers together with associated switchgear, such consumer shall be responsible for the cost of such installation.							
		(b)	In designing such an installation, as provided for above, it shall be competent for the Council to install a transformer with a larger capacity than that called for by the Applicant(s), provided that :-							
			(aa)	The amount payable by the Applicant(s) shall be pro-rated accordingly; and council shall have the right to use any such excess capacity for such other needs as it deems fit.						
			(bb)	In respect of all such installations, the Applicant(s) shall be required to provide a chamber, to the Council's requirements, in which any such transformers, switchgear and equipment shall be accommodated.						

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		(c)	Where application is made for an increased supply and sufficient spare capacity exists on the transformer of greater capacity, the consumer(s) shall in addition to the charges as provided for in these bylaws, be charged the pro-rata cost of the addition							
		(d)	**Approved unmetered supplies for Floodlighting. Telephone Booth Lighting, Illuminated Displays, Streetlights, traffic control installation, Electronic boom controllers, Levels indicators, Security Cameras, and Two Way Radio Installations:-**							
				Basic Demand Based Component per luminaire	**R140.61**	**R161.70**		**R 133.91**	**R 154.00**	
				Basic Demand Based Component per signal head	**R140.61**	**R161.70**		**R 133.91**	**R 154.00**	
				Basic Demand Based Component Per Installation/site	**R140.61**	**R161.70**		**R 133.91**	**R 154.00**	
				Plus Supply Connection Component						
X1.1.9		**Conversion of existing connection**								
		(a)	It is recorded that to the conversion charge in X1.1.9(b) below, must be added the charges in X1.1.3, X1.1.4, X1.1.5, X1.1.6, and X1.1.7 above.							
		(b)	The conversion of any existing supply shall be		**Cost + 10% plus difference between existing kVA and conversion kVA plus the difference in the demand based component**	**Cost + 10% plus difference between existing kVA and conversion kVA plus the difference in the demand based component**		**Cost + 10% plus difference between existing kVA and conversion kVA plus the difference in the demand based component**		
		Installation of Subsidised Budget Energy Controller								
		(i)	A complete service connection inclusive of conventional ready board payable prior to connection, applicable in designated areas only, via a single span connection in areas approved by Council shall be		**R 0.00**	**R 0.00**		**R 0.00**	**R 0.00**	
		(ii)	A complete service connection inclusive of conventional ready board payable prior to connection, applicable in designated areas only, via a single span connection in areas approved by Council shall be		**R63.00**	**R72.45**		**R 60.00**	**R 69.00**	
		(iii)	Conversion of existing conventional metering installation to BEC after the approval of an application received for indigent support (excluding hot plate)		**No Charge**			**No Charge**		
		(iv)	Duplicate Meter Identity Access Cards for the buying of power from Validators		**R24.65**	**R28.35**		**R 23.48**	**R 27.00**	
X1.2	**TESTING OF SERVICE METERS**									
	a)	Installation inside municipal area payable prior to the service being rendered			**Cost plus 10%**	**Cost plus 10%**		**R 553.04**	**R 636.00**	
X1.3	**ADDITIONAL METERS:**									

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	a)	Where an extra single phase meter is required on premises already connected to the Council's mains and where the load can, in the opinion of the Engineer, be safely carried on the existing service connection, the charge shall be		**Cost plus 10%**	**Cost plus 10%**		**Cost plus 10%**		
		Subject to a deposit calculated to cover the full estimated cost of work, which payment shall be adjusted either way, on completion of the work.							
	b)	Where off-peak metering equipment is required by a consumer such installation shall be carried out at the consumer's expense		**Cost plus 10%**	**Cost plus 10%**		**Cost plus 10%**		
		Subject to a deposit calculated to cover the full estimated cost of work, which payment shall be adjusted either way, on completion of the work.							
		The Council shall by resolution, determine the hours during which the off-peak tariffs shall be effective.							
X1.4	**DISCONNECTION AND RECONNECTION CHARGES**								
	a)	If any person neglects to pay any charge for electricity or any other sum due to the council in respect of the supply thereof or the rendering of any service including refuse removal or of the installation or supply of fittings, apparatus, appliances or other items in connection therewith, by the date stipulated on the account rendered, the Council may cut off such supply and for that purpose may cut or disconnect any pipe, electric wire, line or other work through which the electricity or water may be supplied, and may, until such charge or other sum together with the cost incurred by the Council in cutting off and reconnecting such supply of electricity or water, is fully paid, discontinue the supply thereof to such person								
	b)	The charges where a written notice for the non-payment of an account have been issued shall be		**Cost of registered letter**	**Cost of registered letter**		**Cost of registered letter**		
	c)	The charges where a written notice for non-compliances of an installation shall be		**Cost of registered letter**	**Cost of registered letter**		**Cost of registered letter**		
	d)	The charge for disconnection/reconnection of any premises from the mains for the non-payment of an account by a meter reader personnel /contractor shall be		**R739.57**	**R850.50**		**R 704.35**	**R 810.00**	
	e)	The charge for any disconnection or reconnection of any premises for any reason, which involves or necessitates the services of Council's Electrical maintenance personnel shall be		**Cost plus 10%**	**Cost plus 10%**		**Cost plus 10%**		
	f)	(i) The charge for meter tampering for domestic properties:							
		(aa)	First offence plus averaged consumption monitored over a 6 month period	**R7,170.13**	**R8,245.65**		**R 6,828.70**	**R 7,853.00**	
		(bb)	Second offence in terms of the Credit Control Policy	**R9,859.04**	**R11,337.90**		**R 9,389.57**	**R 10,798.00**	

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		(ii) The charge for illegal connection to the electricity supply network for residential properties:							
		(aa)	First offence without legal connection from Council (where demand based component is not raised)	**R10 755. 64 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R12 368. 99 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**		**R10 243.47 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R11 780.00 + New services connection fee as determined by the Technical Services Dept + Demand Based**	
		(bb)	Second offence without legal connection from Council (where demand based component is not raised)	**R13 444. 56 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R15 461. 24 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**		**R12 804.34 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R14 725.00+ New services connection fee as determined by the Technical Services Dept + Demand Based**	
	g)	(i) The charge for meter tampering for commercial properties will be:-							
		(aa)	First offence plus averaged consumption monitored over a 6 month period	**R10,755.65**	**R12,369.00**		**R 10,243.48**	**R 11,780.00**	
		(bb)	Second offence in terms of the Credit Control Policy	**R14,340.26**	**R16,491.30**		**R 13,657.39**	**R 15,706.00**	
		(ii) The charge for illegal connection to the electricity supply network for commercial properties:							
		(aa)	First offence without legal connection from Council (where demand based component is not raised)	**R14 340. 25 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R16 491.30 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**		**R13 657.39 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R15 706.00 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	

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		(bb)		Second offence without legal connection from Council (where demand based component is not raised)	**R17 029.17 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R19 583.55 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**		**R16 218.26 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R18 651.00 + New services connection fee as determined by the Technical Services Dept +**	
	h)			The charge for blocking/unblocking of pre-paid meters, for the non-payment of an account, by an official	**R58.43**	**R67.20**		**R 55.65**	**64.00**	
				Electricity metering and connection equipment remain the property of the Municipality at all times and anyone involved in instances of tampering, damaging or theft thereof is committing a criminal offence and will be liable for prosecution						
X1.5	**CONSUMER COMPLAINTS CALL OUTS**									
	a)			The charge in the case of call outs to repairs and restore a consumer's supply which has not resulted from defects in the Council's service apparatus, which charge shall be a charge against the monthly account of the consumer and for which the supply of power may be disconnected	**Cost plus 10%**	**Cost plus 10%**		**Cost plus 10%**		
X1.6	**TESTING OF INSTALLATIONS:**									
				The charge to be paid in advance to the Town Treasurer for a test on any installation shall be.	**Cost plus 10%**	**Cost plus 10%**		**Cost plus 10%**		
				The distance covered in all cases shall be assessed on both the outward and inward journeys and calculated to the nearest kilometer.						
X1.7	**CHARGES FOR ELECTRICITY SUPPLIED**									
	TARIFFS 1 TO 11 AS APPROVED BY NERSA									
	a)	**TARIFF 1**								
		Industrial, commercial and other consumers, excluding the use of electricity of farmers for irrigation purposes and domestic consumers with a notified maximum demand of 65KVA or more, but not exceeding 1000KVA:								
		(i)		A Service/basic/availability charge as approved by the National Electricity Regulator from time to time, which shall be payable whether or not any electricity is consumed;	**R1,533.60**	**R1,763.64**		**1,460.57**	**1,679.65**	
				PLUS						

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		(ii)	A kilovolt ampere (kVA) charge as approved by the National Electricity Regulator from time to time, for kilovolt ampere (kVA) registered during the standard period on a standard Maximum Demand(MD) meter. A minimum monthly charge of 46kva will apply for any demand registered less than 46kva. Demand greater than 46kva will be charged according to the demand registered.		**R105.16**	**R120.93**		**R 99.00**	**R 113.85**	
			PLUS							
		(iii)	An energy charge (Kwh) as approved by the National Electricity Regulator from time to time		**R1.6523**	**R1.9001**		**1.5555**	**1.7888**	
			Meters are read at least once every 2 months. Estimated charges are raised in months where no meter readings are taken and are adjusted when actual consumption is charged for. A security deposit to cover at least 2.5 months' consumption is required							
				Deposit calculated on the required maximum demand, multiplied by the tariff, multiplied by 2.5						
	a)	**TARIFF 2**								
		Domestic consumers, excluding the use of electricity of farmers for irrigation purposes and industrial/commercial consumers with a notified maximum demand not exceeding 1000KVA:								
		(i)	A Service/basic/availability charge as approved by the National Electricity Regulator from time to time, which shall be payable whether or not any electricity is consumed.		**R932.54**	**R1,072.42**		**R 888.13**	**R 1,021.35**	
			PLUS							
		(ii)	A kilovolt ampere (kVA) charge as approved by the National Electricity Regulator from time to time, for kilovolt ampere (kVA) registered during the standard period on a standard Maximum Demand(MD) meter. A minimum monthly charge of 46kva will apply for any demand registered less than 46kva. Demand greater than 46kva will be charged according to the demand registered.		**R105.15**	**R120.92**		**R 98.99**	**R 113.84**	
			PLUS							
		(iii)	An energy charge (kWh)as approved by the National Electricity Regulator from time to time.		**R1.5615**	**1.7957**		**R 1.47**	**R 1.70**	
			Meters are read at least once every 2 months. Estimated charges are raised in months where no meter readings are taken and are adjusted when actual consumption is charged for. A security deposit to cover at least 2.5 months' consumption is required							
				Deposit calculated on the required maximum demand, multiplied by the tariff, multiplied by 2.5						
	b)	**TARIFF 3:**								

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				Industrial and commercial consumers with a notified maximum demand of less than 65 kVA and all other consumers not incorporated in pursuant of these tariffs.						
		(i)		Service/basic/availability charge per point of connection:						
			a)	A Single Phases connection not exceeding 60 Ampere which shall be payable whether or not any electricity is consumed;	**R358.32**	**R412.07**		**R 341.26**	**R 392.44**	
			b)	A Three phase connection not exceeding 3 X 80 Ampere which shall be payable whether or not any electricity is consumed;	**R358.32**	**R412.07**		**R 341.26**	**R 392.44**	
				PLUS						
		(ii)		An energy charge as approved by the National Electricity Regulator from time to time.	**R2.0753**	**R2.3866**		**R 1.9538**	**R 2.2469**	
		(iii)		Whenever a circuit breaker is replaced with one of the reduced/increased capacity, the consumer requesting such exchange shall be liable for	**Cost plus 10%**	**Cost plus 10%**		**Cost plus 10%**		
				Meters are read at least once every 2 months. Estimated charges are raised in months where no meter readings are taken and are adjusted when actual consumption is charged for. A security deposit to cover at least 2.5 months' consumption is required OR a minimum deposit of	**R 5,000.00**			**R 5,000.00**		
	c)	**TARIFF 4:**								
		1A		**Domestic consumers.**						
				There shall be payable						
		(i)		A monthly service/basic/availability charge per connection point - as approved by the National Electricity Regulator from time to time, which shall be payable whether or not any electricity is consumed;	**R52.80**	**R60.72**		**R 50.29**	**R 57.84**	
				PLUS						
		(ii)		An energy charge as approved by the National Electricity Regulator from time to time.	**R1.9260**	**R2.2149**		**R 1.926**	**R 2.215**	
			a)	Energy consumed between ……...0 to 50						
				Energy consumed between ……50 to 350						
				Energy consumed between …...……351 to 600						
				Energy consumed between ……more than 600						
		1B		**Domestic consumers - Indigent**						
		(i)		First 75 kWh free for Indigent Customers and 250 kWh for child headed households qualifying in terms of policies set by Council	**R1.1507**	**R1.3233**		**R 1.1507**	**R 1.3233**	
		(ii)		Thereafter the cost per kWh shall be as approved by the National Electricity Regulator from time to time	**R1.5754**	**R1.8117**		**R 1.5754**	**R 1.8117**	

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			a)	Energy consumed between ……...0 to 50						
				Energy consumed between ……50 to 350						
				Energy consumed between …...……351 to 600						
				Energy consumed between ……more than 600						
			In the case of the initial exchange of circuit breakers and in the case of any subsequent replacement by circuit breakers of increased or reduced capacity, the cost of exchange shall be		**Cost plus 10%**	**Cost plus 10%**		**Cost plus 10%**		
		2	Meters are read at least once every 2 months. Estimated charges are raised in months where no meter readings are taken and are adjusted when actual consumption is charged for. A security deposit to cover at least 2.5 months' consumption is required OR a minimum deposit of		**R 2,500.000**			**R 2,500.000**		
	d)	**TARIFF 5:**								
		1A		**Religious and other organizations registered in terms of the act as welfare organizations**						
				There shall be payable						
		(i)	A monthly service/basic/availability charge per connection point - as approved by the National Electricity Regulator from time to time, which shall be payable whether or not any electricity is consumed;		**R 0.000**	**R 0.000**		**R 0.000**	**R 0.000**	
				PLUS						
		(ii)	An energy charge as approved by the National Electricity Regulator from time to time.		**R2.1102**	**R2.4267**		**1.9866**	**2.2846**	
			a)	Energy consumed between ……...0 to 50						
				Energy consumed between ……50 to 350						
				Energy consumed between …...……351 to 600						
				Energy consumed between ……more than 600						
		1B		**Religious and other organizations registered in terms of the act as welfare organizations with a notified maximum demand of 65KVA or more, but not exceeding 1000KVA:**						
		(i)	A Service/basic/availability charge as approved by the National Electricity Regulator from time to time, which shall be payable whether or not any electricity is consumed;		**R0.000**	**R0.000**		**R0.000**	**R0.000**	
				PLUS						

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		(ii)	A kilovolt ampere (kVA) charge as approved by the National Electricity Regulator from time to time, for kilovolt ampere (kVA) registered during the standard period on a standard Maximum Demand(MD) meter. A minimum monthly charge of 46kva will apply for any demand registered less than 46kva. Demand greater than 46kva will be charged according to the demand registered.		**R105.34**	**R121.14**		**R 99.17**	**R 114.05**	
				PLUS						
		(iii)	An energy charge (Kwh) as approved by the National Electricity Regulator from time to time		**R1.6517**	**R1.8995**		**1.555**	**1.788**	
			In the case of the initial exchange of circuit breakers and in the case of any subsequent replacement by circuit breakers of increased or reduced capacity, the cost of exchange shall be		**Cost plus 10%**	**Cost plus 10%**		**Cost plus 10%**		
			Meters are read at least once every 2 months. Estimated charges are raised in months where no meter readings are taken and are adjusted when actual consumption is charged for. A security deposit to cover at least 2.5 months' consumption is required OR a minimum deposit of		**R 2,500.000**			**R 2,500.000**		
				Energy consumed ……more than 600						
	e)	**TARIFF 6:**								
		Approved un-metered supplies for floodlighting, telephone booth lighting and street lighting.								
		A security deposit to cover at least 2 months' consumption is required								
		The following formula and tariffs shall apply to all unmetered supplies for floodlighting, street lighting,								
			Monthly Charge = W x 4000 x Tariff Divide by 1000 x 12							
				W = Total lamp wattage of the installation						
				4000 = Annual burning hours						
				1000 = Converting watt to kW						
				12 = Converting annual hours to monthly hours						
		(i)	Installation Maintained by customer							
				Energy charge per kWh	**R2.2263**	**R2.5602**		**R 2.096**	**R 2.411**	
				Per pole - new	**R83.36**	**R95.87**		**R 78.482**	**R 90.255**	
				Per pole up to 200kW	**R299.83**	**R344.80**		**R 282.416**	**R 324.779**	
				Per pole greater than 200Kw	**R350.97**	**R403.62**		**R 330.424**	**R 379.988**	
				Per Traffic Controller per signal head	**R350.97**	**R403.62**		**R 330.424**	**R 379.988**	
		(ii)	Installation Maintained by Municipality							
				Energy charge per kWh	**R2.2263**	**R2.5602**		**R 2.096**	**R 2.411**	
				Per pole up to 200kW	**R299.83**	**R344.80**		**R 282.416**	**R 324.779**	
				Per pole up greater than 200Kw	**R350.97**	**R403.62**		**R 330.424**	**R 379.988**	
				Per Traffic Controller per signal head	**R350.97**	**R403.62**		**R 330.424**	**R 379.988**	

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		(iii)	A charge per floodlight, telephone booth lighting and street lighting where the maintenance is maintained by Council as approved by the National Electricity Regulator from time to time, per pole shall be		**R350.97**	**R403.62**		**R 330.424**	**R 379.988**	
		(iv)	These lights shall operate with the Council's streetlights and any expenses incurred by the Council on the maintenance of such installation shall be recoverable from the consumer . The consumer may, at the discretion of the Engineer be required to provide material (spares)		**Cost plus 10%**	**Cost plus 10%**		**Cost plus 10%**		
		(v)	A charge per floodlight, telephone booth lighting and street lighting where the maintenance is maintained by the customer as approved by the National Electricity Regulator from time to time, per pole shall be		**R350.97**	**R403.62**		**R 330.424**	**R 379.988**	
		(vi)	A charge per traffic controller installation per signal head, shall be		**R350.97**	**R403.62**		**R 330.424**	**R 379.988**	
	f)	Approved unmetered low consumption installations.								
		(i)	A security deposit to cover at least 2 months' consumption is required							
			Such as 2 way radio installations; road traffic counter installation; water reservoir level indicators; security cameras, boom controls;							
				Per installation	**R350.97**	**R403.62**		**R 330.424**	**R 379.988**	
		(ii)	Illuminated advertising signs							
			Basic monthly charge		**R341.79**	**R393.06**		**R 325.523**	**R 374.351**	
			Energy charge as approved by the National Electricity Regulator from time to time		**R2.0532**	**R2.3612**		**R 1.933**	**R 2.223**	
	g)	**TARIFF 7:**								
		(aa)	Sappi Fine Paper by agreement		**By agreement - aligned to Eskom tariffs.**			**By agreement - aligned to Eskom tariffs.**		
			1	Basic Monthly Charge						
			(i)	**HIGH Seasons:** Demand tariff per month as approved by the National Electricity Regulator from time to time.	**R35.83**	**R41.20**		**33.520**	**38.548**	
			(ii)	**LOW Season:** Demand tariff per month as approved by the National Electricity Regulator from time to time.	**R35.83**	**R41.20**		**33.520**	**38.548**	
				PLUS						
			2	A Kwh energy charge as approved by the National Electricity Regulator from time to time.						
			(i)	Energy Charge : **Low Season : Off Peak**	**R0.5253**	**R0.6041**		**0.4910**	**0.5647**	
			(ii)	Energy Charge : **Low Season : Standard**	**R0.8282**	**R0.9524**		**0.7750**	**0.8913**	

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			(iii)	Energy Charge : **Low Season : Peak**	**R1.2034**	**R1.3839**		**1.1260**	**1.2949**	
			(iv)	Energy Charge : **High Season : Off Peak**	**R0.6068**	**R0.6978**		**0.5680**	**0.6532**	
			(v)	Energy Charge : **High Season : Standard**	**R1.1174**	**R1.2850**		**1.0450**	**1.2018**	
			(vi)	Energy Charge : **High Season : Peak**	**R3.6885**	**R4.2418**		**3.4500**	**3.9675**	
			3	**Other chrges**						
			(i)	TX Network capacity charge (per KVA)	**R9.54**	**R10.97**		**8.920**	**10.258**	
			(ii)	Network capacity charge (per KVA)	**R18.90**	**R21.74**		**17.680**	**20.332**	
			(iii)	Network demand charge (per KVA)	**R35.83**	**R41.20**		**33.520**	**38.548**	
			(iv)	Reactive Energy charge (per KVAR) - (**High Season)**	**R0.1656**	**R0.1904**		**0.1550**	**0.1783**	
			(v)	Ancilliary service charge (per KwH)	**R0.0047**	**R0.0054**		**0.0044**	**0.0051**	
			(vi)	Electrification and Rural Network Subsidy Charge	**R0.0917**	**R0.1055**		**0.8580**	**0.9867**	
			(vii)	Surcharge (5% of Total (i), (ii), (iii) & (iv))						
			(viii)	Surcharge (15% of Total kwh - Off Peak , Standard & Peak) + (Electrification & Rural Subsidy) + (Ancilliary Service Charge)						
			(ix)	Distribution Loss Charge (0,5% of Total Kwh - Off Peak , Standard & Peak) + (Electrification & Rural Subsidy) + (Ancilliary Service Charge)						
			(ii)	KvA high demand						
			(ii)	Energy low demand						
			(iii)	KvA low demand						
		(bb)	Supplies to large consumers exceeding 1 000 kVA							
			(i)	Basic Monthly charge	**R1,533.60**	**R1,763.64**		**R 1,460.57**	**R 1,679.65**	
			(ii)	A Demand tariff per month as approved by the National Electricity Regulator from time to time, for kilovolt ampere (kva) registered. A minimum monthly charge of 700kva will apply for any demand registered less than 700kva. Demand registered greater than 700kva will be charged according to the demand.	**R91.52**	**R105.25**		**R 86.16**	**R 99.08**	
				PLUS						

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			(iii)	an energy charge during the off peak/Low demand period as approved by the National Electricity Regulator from time to time	**R1.59**	**R1.83**		**R 1.50**	**R 1.73**	
				PLUS						
			Meters are read at least once every 2 months. Estimated charges are raised in months where no meter readings are taken and are adjusted when actual consumption is charged for. A security deposit to cover at least 2.5 months' consumption is required							
			Deposit calculated on the required maximum demand, multiplied by the tariff, multiplied by 2.5							
	H	**TARIFF 8:**								
				Premises equipped with Budget Energy Control Metering system						
		(i)	First 75 kWh free for Indigent Customers and 250 kWh for child headed households qualifying in terms of policies set by Council		**R1.2060**	**R1.3869**		**1.2060**	**1.3869**	
		(ii)	Thereafter the cost per kWh shall be as approved by the National Electricity Regulator from time to time, and shall be payable in advance.		**R1.8189**	**R2.0917**		**1.8189**	**2.0917**	
			a)	Energy consumed between ……...0 to 50						
				Energy consumed between ……50 to 350						
				Energy consumed between …...……351 to 600						
				Energy consumed between ……more than 600						
		(iii)	Domestic other than registered indigent customers - the cost per kWh shall be as approved by the National Electricity Regulator from time to time and shall be payable in advance per kWh be		**R1.8189**	**R2.0917**		**R 1.8189**	**R 2.0917**	
			a)	Energy consumed between ……...0 to 50						
				Energy consumed between ……50 to 350						
				Energy consumed between …...……351 to 600						
				Energy consumed between ……more than 600						
		(iv)	Commercial Prepaid metering		**R2.2667**	**R2.6067**		**R 2.134**	**R 2.454**	
			Customers on conventional type Maximum Demand metering cannot convert to prepaid metering							
	I	**TARIFF 9:**								
		1A		**TOU Industrial, Commercial and other customers with a notified maximum demand greater than 65kVa including shops, factories, hostels, boarding houses, restaurants, office buildings and residential buildings in which individual units are not separetely metered.**						
		(i)		Basic Monthly charge	**R1,533.60**	**R1,763.64**		**R 1,460.57**	**R 1,679.65**	

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		(ii)		Peak	**R4.5337**	**R5.2138**		**R 4.2682**	**R 4.9084**	
		(iii)		Standard	**R1.8618**	**R2.1411**		**R 1.7528**	**R 2.0157**	
		(iv)		Off peak	**R1.0087**	**R1.1600**		**R 0.9496**	**R 1.0920**	
		(v)		Demand tariff per kVa as approved by the National Electricity Regulator from time to time,	**R80.23**	**R92.26**		**R 75.53**	**R 86.86**	
		1B		**Seasonal - TOU Industrial, Commercial and other customers with a notified maximum demand greater than 65kVa including shops, factories, hostels, boarding houses, restaurants, office buildings and residential buildings in which individual units are not separetely metered.**						
		(i)		Basic Monthly charge	**R1,533.60**	**R1,763.64**		**R 1,460.57**	**R 1,679.66**	
		(ii)		HIGH Season: Demand tariff per kVa as approved by the National Electricity Regulator from time to time,	**R80.23**	**R92.26**		**R 75.53**	**R 86.86**	
		(iii)		LOW Season: Demand tariff per kVa as approved by the National Electricity Regulator from time to time.	**R80.23**	**R92.26**		**R 75.53**	**R 86.86**	
				PLUS						
		2		an energy charge during the off peak/**Low demand period** as approved by the National Electricity Regulator from time to time						
		(i)		Energy charge: Low Season: Off Peak	**R0.8026**	**R0.9230**		**R 0.7556**	**R 0.8689**	
		(ii)		Energy charge: Low Season: Standard	**R1.2211**	**R1.4042**		**R 1.1496**	**R 1.3220**	
		(iii)		Energy charge: Low Season: Peak	**R1.8594**	**R2.1383**		**R 1.7505**	**R 2.0131**	
		(iv)		Energy charge: High Season: Off Peak	**R1.0087**	**R1.1600**		**R 0.9496**	**R 1.0920**	
		(v)		Energy charge: High Season: Standard	**R1.8618**	**R2.1411**		**R 1.7528**	**R 2.0157**	
		(vi)		Energy charge: High Season: Peak	**R4.5337**	**R5.2138**		**R 4.2682**	**R 4.9085**	
				Meters are read at least once every 2 months. Estimated charges are raised in months where no meter readings are taken and are adjusted when actual consumption is charged for. A security deposit to cover at least 2.5 months' consumption is required						
				Any meter conversions relating to Tariff 9 shall be for the account of the applicant.						
				Deposit calculated on the required maximum demand, multiplied by the tariff, multiplied by 2.5						

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	Where no consumer agreements exist, the registered owner/owners of the property concerned shall be responsible for a minimum monthly charge as defined in the tariffs 1 to 7 above									
	J	**TARIFF 10:**								
				TOU Industrial, Commercial and other customers with a notified maximum demand of less than 65kVa including shops, factories, hostels, boarding houses, restaurants, office buildings and residential buildings in which individual units are not separetely metered.						
		(i)		Basic Monthly charge	**R1,533.60**	**R1,763.64**		**R 1,460.57**	**R 1,679.65**	
				PLUS						
				A kilovolt ampere (kVA) charge as approved by the National Electricity Regulator from time to time, for kilovolt ampere (kVA) registered during the standard period on a standard Maximum Demand(MD) meter. A minimum monthly charge of 46kva will apply for any demand registered less than 46kva. Demand greater than 46kva will be charged according to the demand registered.	**R105.16**	**R120.93**		**R 99.00**	**R 113.85**	
				PLUS						
				an energy charge of:						
		(ii)		Energy charge: Off Peak	**R0.609**	**R0.700**		**R 0.573**	**R 0.659**	
		(iii)		Energy charge: Standard	**R1.235**	**R1.420**		**R 1.162**	**R 1.337**	
		(iv)		Energy charge: Peak	**R3.912**	**R4.499**		**R 3.683**	**R 4.235**	
				Any meter conversions relating to Tariff 10 shall be for the account of the applicant.						
	K	**TARIFF 11:**								
				TOU : RESIDENTIAL						
		(i)		Basic Monthly charge	**R93.87**	**R107.96**		**R 89.40**	**R 102.82**	
				PLUS						
				an energy charge during the off peak/**Low demand period** as approved by the National Electricity Regulator from time to time						
		(i)		Energy charge: Off Peak	**R1.050**	**R1.207**		**R 0.988**	**R 1.136**	

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		(ii)		Energy charge: Standard	**R1.418**	**R1.631**		**R 1.335**	**R 1.535**	
		(iii)		Energy charge: Peak	**R2.837**	**R3.262**		**R 2.670**	**R 3.071**	
				Any meter conversions relating to Tariff 11 shall be for the account of the applicant.						
X1.8	**ELECTRICITY AVAILABILITY CHARGE**									
		In respect of any approved subdivision, with or without improvements, which is not connected to the Council's electricity scheme and which can reasonably be so connected, the owner shall pay to the Council an electricity availability charge as stipulated hereunder, in accordance with the Electricity By-Laws Item 18(1) provided that								
	a)	No charge shall be made against any subdivision which exceeds 2 ha;								
	b)	No charge shall be made against any property complying with the requirements of Section 17 (1) (i) of the Municipal Property Rates Act, No 6 of 2004								
	c)	No charge shall be made against one subdivision which is used for bona fide gardening purposes in conjunction with an adjoining subdivision on which there is erected a dwelling house which is connected to the Council's electricity scheme, if such subdivision is owned by the same person or the spouse of the person who owns such dwelling house;								
	d)	In any area where no town planning scheme in terms of the Ordinance 27 of 1949 is in existence, the charge shall be levied as if such property is zoned for special residential use.								
	e)	Depending on the zoning of such subdivision in terms of any town planning scheme in force from time to time, the monthly charges per subdivision shall be as follows:								
		(I)		Irrespective of the zoning of the property there shall be payable a monthly charge of	**R115.50**	**R132.83**		**R 110.00**	**R 126.50**	
				If zoned for other purposes	**R115.50**	**R132.83**		**R 110.00**	**R 126.50**	
X1.9	**GENERAL PROVISIONS**									
	a)			**Notified maximum demand:**						
		(I)		Every existing consumer with an installed load in excess of 60 A shall, when called upon to do so, notify the Council in writing of the maximum which he requires the Council to supply.						
		(ii)		Every new consumer requiring a supply of electricity in excess of 60A single phase or 20A three-phase shall give three months prior written notice of his requirements; provided that the period of notice may be reduced at the discretion of the Engineer.						

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		(iii)	Every existing consumer who wishes to increase his installed load shall give the Council three months prior written notice of his requirements, provided that the period of notice may be reduced at the discretion of the Engineer.						
		(iv)	With effect from the date on which the Council is in a position to meet the notified requirements or the date stipulated in the notice given under paragraph (bb) or (cc), whichever is the later, the amperage charge or the maximum demand charge applicable to such consumer shall be adjusted accordingly.						
		(v)	In the event of the actual consumption of any consumer exceeding his notified maximum demand, the Engineer may call upon such consumer to negotiate an increased notified maximum demand in terms of this Bylaw. Should such consumer fail to notify the Board of his increased requirements within thirty (30) days of being called upon to do so, the Engineer, after inspection of the consumer's installation may notify the Town Treasurer of such increased notified maximum demand as should, in his opinion apply to such consumer for accounting purposes and the charges therefore shall be adjusted accordingly.						
	b)	**Bulk Supply Installation**							
		(I)	Where the joint requirements of any two or more consumers necessitate, in the opinion of the Engineer, the specific installation of one or more transformers together with associated switch gear , such consumers shall jointly be responsible for the cost of such installation, in proportion to their individual requirements.						
		(ii)	In designing such a bulk supply installation, as provided for under item (i) above, it shall be competent for the Council to install a transformer with a larger capacity than that called for by the applicant, provided that						
		(iii)	The amount payable by the Applicant shall be pro-rated accordingly : and Council shall have the right to use any such excess capacity for such other needs as it deems fit.						
		(iv)	In respect of all bulk installations the applicant shall be required to provide a chamber, to the Council's requirements, in which any such transformers, switch gear and equipment shall be accommodated.						

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		(v)	Where application is made for an increased supply and sufficient spare capacity exists on the transformer of greater capacity, the consumer shall in addition to the charges as provided for in these by-laws, be charged the pro-rata cost of the additional transformer capacity based upon the cost of a new transformer or Mini Sub Station of that capacity at that time, plus 10%.							
X1.10	**REDUNDANT STREETLIGHT POLES**									
	a)	Whole poles, as is, per meter			**R39.09**	**R44.96**		**R 35.22**	**R 40.50**	
				(Maximum of 60 meters per person)						
Z 1	**SURCHARGE**									
		The Council may, by resolution, in respect of all consumers enforce a surcharge by means of a percentage on the total of the various tariffs, provided that such surcharge shall at no time exceed 50 (fifty) percentum.								
				COMPILED BY :						
				T P GUMEDE						
				N SINGH						
				CHECKED BY:						
				S I TSWANA						

DRAFT TARIFF OF CHARGES

2021/2022

				2021/22 (EXCL VAT)	2021/22 (INCL VAT)	2020/21 (EXCL VAT)	2020/21 (INCL VAT)	COMMENTS
1. VALUE ADDED TAX MUST BE ADDED TO ALL TARIFFS LISTED BELOW (EXCEPT TO FINES, REFUNDABLE DEPOSITS, INTEREST CHARGES OR WHERE INDICATED AS INCLUSIVE OF VALUE ADDED TAX) 2. ALL APPROVALS OF APPLICATIONS FOR SERVICES LISTED BELOW SHALL BE SUBJECT TO THE APPLICANT OBTAINING A CLEARANCE TO THE EFFECT THAT KWADUKUZA MUNICIPAL ACCOUNTS IN THE NAME OF THE APPLICANT/OWNER ARE NOT IN ARREARS								
A 1	**OUTDOOR ADVERTISING**							
ALL APPLICATIONS SHALL BE IN TERMS OF THE KWADUKUZA MUNICIPALITY'S OUTDOOR ADVERTISING POLICY AND BY-LAWS.								
DISCLAIMER: 1.ALL DISPLAY FEES ARE A MINIMUM CHARGE AND MAY VARY IN TERMS OF PROPOSALS/ AGREEMENTS WITH SERVICE PROVIDERS FROM TIME TO TIME								
DISCLAIMER:2. ALL DISPLAY FEES OWED TO THE KWADUKUZA MUNICIPALITY WILL BE CHARGED AS PER THE TARRIFF STRUCTURE FOR THE SPECIFIC FINANCIAL YEAR.								
DISCLAIMER:3.NO FUTURE APPLICATIONS WILL BE ACCEPTED BY KWADUKUZA MUNICIPALITY FROM APPLICANTS THAT HAVE DEFAULTED IN PAYMENT OF ANNUAL/MONTHLY DISPLAY FEES, AND REFUSE TO SETTLE OUTSTANDING AMOUNTS.								
	(a)	Pre-strutiny for all applications excluding Billboards		**231.97**	**266.77**	**225.22**	**259.00**	
	NON-PERMANENT SIGNS							
	(b)	**General advertisements of both commercial and non-commercial nature:**						
		(i)	Up to 50 posters, or part thereof	**1,334.52**	**1,534.70**	**1,295.65**	**1,490.00**	
		(iii))	Each poster thereafter, an additional	**31.35**	**36.05**	**30.43**	**35.00**	
		(iii)	Refundable deposit (refer to note below)	**500.00**	**500.00**	**500.00**	**500.00**	

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		(i)	Disposal Charge based on actual mass, per ton	**483.48**	**556.00**	**483.48**	**556.00**	
		(ii)	Disposal Charge based on carrying capacity, per ton	**483.48**	**556.00**	**483.48**	**556.00**	
		(iii)	Disposal Charge based on actual mass, per quarter of a metric ton	**120.87**	**139.00**	**120.87**	**139.00**	
	(d)	**General Waste: Received from outside the Municipal Area**						
		(i)	Disposal Charge based on actual mass, per ton	**628.70**	**723.00**	**628.70**	**723.00**	
		(ii)	Disposal Charge based on carrying capacity,per ton	**628.70**	**723.00**	**628.70**	**723.00**	
		(iii)	Disposal Charge based on actual mass, per quarter of a metric ton	**157.39**	**181.00**	**157.39**	**181.00**	
	(e)	**Special Waste: Based on Actual Mass**						
		(i)	Disposal of special waste generated inside of KDM, per metric ton	**640.87**	**737.00**	**640.87**	**737.00**	
		(ii)	Disposal of special waste generated outside of KDM. Per metric ton	**706.96**	**813.00**	**706.96**	**813.00**	
		(iii)	Disposal of special waste generated inside of KDM, per quarter of a metric ton	**160.17**	**184.20**	**160.17**	**184.20**	
		(iv)	Disposal of special waste generated outside of KDM, per quarter of metric ton	**176.52**	**203.00**	**176.52**	**203.00**	
X1	**SUPPLY OF ELECTRICITY**							
	Designated electrical installations shall mean electrical wiring installations within dwelling units, community halls, or such like public facilities, subsidized by National, Provincial, or Local Government							
X1.1	**INSTALLATION OF ELECTRICITY SERVICES:**							
X1.1.1	(a)	The charges payable to the KwaDukuza Municipality ("KDM") for the "installation" of services shall be as per the tariffs listed hereunder.						
	(b)	Any and all headings used in this section are for convenience only. Although the heading of this section contains the word "Installation", this section does not only deal with installation but contains the KDM's charges for both the provision and installation of electrical and allied services.						
	(c)	All the charges referred to in this section, whether estimated or final, shall be paid to KDM prior to any connection or installation.						
	(d)	All the charges listed hereunder must be paid unless exempted in terms of a written agreement concluded with the municipality.						

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	(e)	In the case of a proposed sectional title development, or a proposed share block scheme, or a proposed commercial development, only the registered owner at the time (and not any future owner(s) or "developer") may apply for and be granted electrical services.						
X1.1.2		**Standard Services**						
		Only prepayment or electronic meters with online reading facilities will be installed in farm areas						
X1.1.3		**DEMAND BASED COMPONENT ("DBC")**						
	(a)	(i)	Indigent persons: The DBC charge is not applicable to any dwelling or unit occupied by person(s) registered as being indigent with the KDM / its Council. In the case of dwelling units within which persons registered with Council as being indigent residence, the circuit breaker capacity shall be limited to 20 Ampere Single Phase.					
		(ii)	**NEW Installations (Council Developed)**					
			Low Income Unit	**Exempt**	**Exempt**			
			Community Residential Unit	**Exempt**	**Exempt**	**Exempt**	**Exempt**	
			Social Housing Units	**Exempt**	**Exempt**	**Exempt**	**Exempt**	
			Affordable/ Gap Unit (Approved as FLISP)	**50% OF THE FEES PAID BY NORMAL DEVELOPMENT**	**50% OF THE FEES PAID BY NORMAL DEVELOPMENT**	**50% OF THE FEES PAID BY NORMAL DEVELOPMENT**	**50% OF THE FEES PAID BY NORMAL DEVELOPMENT**	
	(b)		Irrespective of any payment made by the developer for the provision of a firm bulk electrical supply in terms of a services agreement entered into between the Municipality and the developer concerned, the DBC charge shall be payable as stated in X1.1.3 (c) below unless exempted by written agreement concluded with KDM.					
	(c)		The DBC charge is levied and payable by and in respect of –					
		(i)	each unit / dwelling / flat on a property (owner occupied or owner let properties);					
		(ii)	each and every unit / dwelling unit / section in a sectional title or shareblock development, irrespective of whether or not there is a change in the erf number.					
	(d)	**The charges for the DBC are-**						

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			The charge per kVA applied for as recorded on the official supply application document PER kVA shall be	**R4,090.28**	**R4,703.82**	**R3,895.50**	**R4,479.83**	
		(i)	Single phase *60 Amp = 13.8 kVA Load - KVA (admin) = 4.7 kVA*					
			Basic Demand Based Component	**R19,224.72**	**R22,108.43**	**R18,309.26**	**R21,055.65**	
			Plus: Complete Service Connection Component including cables etc	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
			OR Partial Service connection (Not including cables)	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
			Places of worship: (a) 50% rebate be applicable at the time of application					
			(b) Demand contribution is payable over six months without attracting interest					
			(c) The rebate structure is only granted once to a religious organisation					
			(d) Should the premises be sold off at a later stage and should the use of the premises change, the new owner will be compelled to pay in the difference between the full approved tariff of charges at that point in time and what was paid in as a charge at the time of application for electricity by the religious organisation.					
		(ii)	Three Phase *(Maximum 60A) - (1.73x4.7 = 8.131kVA)*					
			Basic Demand Based Component	**R33,258.11**	**R38,246.83**	**R31,674.39**	**R36,425.55**	
			Plus: Complete Service Connection Component including cables etc	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
			OR Partial Service connection (Not including cables)	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
			Places of worship: (a)75% rebate be applicable at the time of application					
			(b)Demand contribution is payable over six months without attracting interest					
			(c)The rebate structure is only granted once to a religious organisation					
			(d)Should the premises be sold off at a later stage and should the use of the premises change, the new owner will be compelled to pay in the difference between the full approved tariff of charges at that point in time and what was paid in as a charge at the time of application for electricity by the religious organisation.					
		(iii)	Three Phase *(Maximum 150A) - 1.73x2.5x4.7=20.33kVA)*					
			Basic Demand Based Component	**R83,155.34**	**R95,628.65**	**R79,195.57**	**R91,074.90**	
			Plus: Service Connection Component	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
			Places of worship: (a)75% rebate be applicable at the time of application					
			(b)Demand contribution is payable over six months without attracting interest					

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			(c)The rebate structure is only granted once to a religious organisation					
			(d)Should the premises be sold off at a later stage and should the use of the premises change, the new owner will be compelled to pay in the difference between the full approved tariff of charges at that point in time and what was paid in as a charge at the time of application for electricity by the religious organisation.					
		(iv)	Three Phase (Maximum 80 A) - (1.73x1.33*4.7=10.81)					
			Basic Demand Based Component	**R44,216.00**	**R50,848.40**	**R42,110.48**	**R48,427.05**	
			Plus: Complete Service Connection Component including cables etc	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
			OR Partial Service connection (Not including cables)	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
			Places of worship: (a)75% rebate be applicable at the time of application					
			(b)Demand contribution is payable over six months without attracting interest					
			(c)The rebate structure is only granted once to a religious organisation					
			(d)Should the premises be sold off at a later stage and should the use of the premises change, the new owner will be compelled to pay in the difference between the full approved tariff of charges at that point in time and what was paid in as a charge at the time of application for electricity by the religious organisation.					
		(v)	Basic Demand Based Component for every 3X25A or part thereof (= 17.25kVA) - (1.73x0.42x4.7=3.42)	**R13,989.29**	**R16,087.68**	**R13,323.13**	**R15,321.60**	
			Plus: Service Connection Component	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
			Places of worship: (a)75% rebate be applicable at the time of application					
			(b)Demand contribution is payable over six months without attracting interest					
			(c)The rebate structure is only granted once to a religious organisation					
			(d)Should the premises be sold off at a later stage and should the use of the premises change, the new owner will be compelled to pay in the difference between the full approved tariff of charges at that point in time and what was paid in as a charge at the time of application for electricity by the religious organisation.					
X1.1.4			**Service Connection Component**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
X1.1.5			**Network connection charge**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
			The fees calculated must be paid upfront by the developer prior to any electrical supply being made available					
X1.1.6		**Bulk Supplies and Internal Services for Developments**						

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		(a)	KDM's charges for bulk supplies and internal services for developments are usually regulated by a written agreement between a party and the KDM in accordance with the Council approved policy in respect of Developer contribution as may be amended from time to time.					
		(b)	The developer / registered owner is liable for all wiring and reticulation costs from any bulk meter to the individual units, and also liable for all "internal" wiring and reticulation costs.					
X1.1.7			Ad Hoc 11kV/420 V Installations for Commercial and Service Industry (excluding residential developments)					
			Basic Demand Based Component …. Per kVA	**R4,090.28**	**R4,703.82**	**R3,895.50**	**R4,479.83**	
			Plus: Service Connection Component As indicated below	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	**Cost + 10%**	
X1.1.8			**General**					
		(a)	Where the requirements of any one or more consumers / Applicant(s) ("consumer") necessitate, in the opinion of the KDM, the specific installation of one or more transformers together with associated switchgear, such consumer shall be responsible for the cost of such installation.					
		(b)	In designing such an installation, as provided for above, it shall be competent for the Council to install a transformer with a larger capacity than that called for by the Applicant(s), provided that :-					
			(aa) The amount payable by the Applicant(s) shall be pro-rated accordingly; and council shall have the right to use any such excess capacity for such other needs as it deems fit.					
			(bb) In respect of all such installations, the Applicant(s) shall be required to provide a chamber, to the Council's requirements, in which any such transformers, switchgear and equipment shall be accommodated.					
		(c)	Where application is made for an increased supply and sufficient spare capacity exists on the transformer of greater capacity, the consumer(s) shall in addition to the charges as provided for in these bylaws, be charged the pro-rata cost of the addition					
		(d)	A**pproved unmetered supplies for Floodlighting. Telephone Booth Lighting, Illuminated Displays, Streetlights, traffic control installation, Electronic boom controllers, Levels indicators, Security Cameras, and Two Way Radio Installations:-**					

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				Basic Demand Based Component per luminaire	**R147.64**	**R169.79**	**R140.61**	**R161.70**	
				Basic Demand Based Component per signal head	**R147.64**	**R169.79**	**R140.61**	**R161.70**	
				Basic Demand Based Component Per Installation/site	**R147.64**	**R169.79**	**R140.61**	**R161.70**	
				Plus Supply Connection Component					
X1.1.9		**Conversion of existing connection**							
		(a)		It is recorded that to the conversion charge in X1.1.9(b) below, must be added the charges in X1.1.3, X1.1.4, X1.1.5, X1.1.6, and X1.1.7 above.					
		(b)		The conversion of any existing supply shall be	**Cost + 10% plus difference between existing kVA and conversion kVA plus the difference in the demand based component**	**Cost + 10% plus difference between existing kVA and conversion kVA plus the difference in the demand based component**	**Cost + 10% plus difference between existing kVA and conversion kVA plus the difference in the demand based component**	**Cost + 10% plus difference between existing kVA and conversion kVA plus the difference in the demand based component**	
		Installation of Subsidised Budget Energy Controller							
		(i)		A complete service connection inclusive of conventional ready board payable prior to connection, applicable in designated areas only, via a single span connection in areas approved by Council shall be	**R 0.00**	**R 0.00**	**R 0.00**	**R 0.00**	
		(ii)		A complete service connection inclusive of conventional ready board payable prior to connection, applicable in designated areas only, via a single span connection in areas approved by Council shall be	**R66.15**	**R76.07**	**R63.00**	**R72.45**	
		(iii)		Conversion of existing conventional metering installation to BEC after the approval of an application received for indigent support (excluding hot plate)	**No Charge**		**No Charge**		
		(iv)		Duplicate Meter Identity Access Cards for the buying of power from Validators	**R24.65**	**R28.35**	**R24.65**	**R28.35**	
X1.2	**TESTING OF SERVICE METERS**								
	a)			Installation inside municipal area payable prior to the service being rendered	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	
X1.3	**ADDITIONAL METERS:**								
	a)			Where an extra single phase meter is required on premises already connected to the Council's mains and where the load can, in the opinion of the Engineer, be safely carried on the existing service connection, the charge shall be	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	
				Subject to a deposit calculated to cover the full estimated cost of work, which payment shall be adjusted either way, on completion of the work.					

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	b)	Where off-peak metering equipment is required by a consumer such installation shall be carried out at the consumer's expense		**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	
		Subject to a deposit calculated to cover the full estimated cost of work, which payment shall be adjusted either way, on completion of the work.						
		The Council shall by resolution, determine the hours during which the off-peak tariffs shall be effective.						
X1.4	**DISCONNECTION AND RECONNECTION CHARGES**							
	a)	If any person neglects to pay any charge for electricity or any other sum due to the council in respect of the supply thereof or the rendering of any service including refuse removal or of the installation or supply of fittings, apparatus, appliances or other items in connection therewith, by the date stipulated on the account rendered, the Council may cut off such supply and for that purpose may cut or disconnect any pipe, electric wire, line or other work through which the electricity or water may be supplied, and may, until such charge or other sum together with the cost incurred by the Council in cutting off and reconnecting such supply of electricity or water, is fully paid, discontinue the supply thereof to such person						
	b)	The charges where a written notice for the non-payment of an account have been issued shall be		**Cost of registered letter**	**Cost of registered letter**	**Cost of registered letter**	**Cost of registered letter**	
	c)	The charges where a written notice for non-compliances of an installation shall be		**Cost of registered letter**	**Cost of registered letter**	**Cost of registered letter**	**Cost of registered letter**	
	d)	The charge for disconnection/reconnection of any premises from the mains for the non-payment of an account by a meter reader personnel /contractor shall be		**R739.57**	**R850.50**	**R739.57**	**R850.50**	
	e)	The charge for any disconnection or reconnection of any premises for any reason, which involves or necessitates the services of Council's Electrical maintenance personnel shall be		**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	
	f)	(i) The charge for meter tampering for domestic properties:						
		(aa)	First offence plus averaged consumption monitored over a 6 month period	**R7,528.64**	**R8,657.93**	**R7,170.13**	**R8,245.65**	

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		(bb)	Second offence in terms of the Credit Control Policy	**R10 352. 00 + New services connection fee as determined by the Technical Services Dept**	**R11 904,80 + New services connection fee as determined by the Technical Services Dept**	**R9,859.04**	**R11,337.90**	
		(ii) The charge for illegal connection to the electricity supply network for residential properties:						
		(aa)	First offence without legal connection from Council (where demand based component is not raised)	**R10 755. 64 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R12 368. 99 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R10 755. 64 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R12 368. 99 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	
		(bb)	Second offence without legal connection from Council (where demand based component is not raised)	**R13 444. 56 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R15 461. 24 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R13 444. 56 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R15 461. 24 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	
	g)	(i) The charge for meter tampering for commercial properties will be (In case of sub letting, fine is per household or per business), Residential sub letting of more than 4 household is clasiffied commercial :-						
		(aa)	First offence plus averaged consumption monitored over a 6 month period	**R11,293.43**	**R12,987.45**	**R10,755.65**	**R12,369.00**	
		(bb)	Second offence in terms of the Credit Control Policy	**R15 057,27 + New services connection fee as determined by the Technical Services Dept**	**R17 315.87 + New services connection fee as determined by the Technical Services Dept**	**R14,340.26**	**R16,491.30**	

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		(ii) The charge for illegal connection to the electricity supply network for commercial properties (In case of sub letting, fine is per household or per business), Residential sub letting of more than 4 household is clasiffied commercial:							
		(aa)	First offence without legal connection from Council (where demand based component is not raised)		**R15 075. 26 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R17 315.85 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R14 340. 25 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R16 491.30 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	
		(bb)	Second offence without legal connection from Council (where demand based component is not raised)		**R17 880,63 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R20 562,72 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R17 029.17 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	**R19 583.55 + New services connection fee as determined by the Technical Services Dept + Demand Based Component**	
	h)	The charge for blocking/unblocking of pre-paid meters, for the non-payment of an account, by an official			**R58.43**	**R67.20**	**R58.43**	**R67.20**	
			Electricity metering and connection equipment remain the property of the Municipality at all times and anyone involved in instances of tampering, damaging or theft thereof is committing a criminal offence and will be liable for prosecution						
X1.5	**CONSUMER COMPLAINTS CALL OUTS**								
	a)	The charge in the case of call outs to repairs and restore a consumer's supply which has not resulted from defects in the Council's service apparatus, which charge shall be a charge against the monthly account of the consumer and for which the supply of power may be disconnected			**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	
X1.6	**TESTING OF INSTALLATIONS:**								
				The charge to be paid in advance to the Town Treasurer for a test on any installation shall be.	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	

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				The distance covered in all cases shall be assessed on both the outward and inward journeys and calculated to the nearest kilometer.					
X1.7	**CHARGES FOR ELECTRICITY SUPPLIED**								
	TARIFFS 1 TO 11 AS APPROVED BY NERSA								
	a)	**TARIFF 1**							
		Industrial, commercial and other consumers, excluding the use of electricity of farmers for irrigation purposes and domestic consumers with a notified maximum demand of 65KVA or more, but not exceeding 1000KVA:							
		(i)		A Service/basic/availability charge as approved by the National Electricity Regulator from time to time, which shall be payable whether or not any electricity is consumed;	**R1,533.60**	**R1,763.64**	**R1,533.60**	**R1,763.64**	
				PLUS					
		(ii)		A kilovolt ampere (kVA) charge as approved by the National Electricity Regulator from time to time, for kilovolt ampere (kVA) registered during the standard period on a standard Maximum Demand(MD) meter. A minimum monthly charge of 46kva will apply for any demand registered less than 46kva. Demand greater than 46kva will be charged according to the demand registered.	**R120.50**	**R138.58**	**R105.16**	**R120.93**	
				PLUS					
		(iii)		An energy charge (Kwh) as approved by the National Electricity Regulator from time to time	**R1.8934**	**R2.1774**	**R1.6523**	**R1.9001**	
				Meters are read at least once after every 2 months. Estimated charges are raised in months where no meter readings are obtained and are adjusted when actual consumption is charged for. If estimated charges are applicable, this is calculated based on a six month prior billing daily average. A security deposit to cover at least 2.5 months' consumption is required					
				Deposit calculated on the required maximum demand, multiplied by the tariff, multiplied by 2.5					
	a)	**TARIFF 2**							
		Domestic consumers, excluding the use of electricity of farmers for irrigation purposes and industrial/commercial consumers with a notified maximum demand not exceeding 1000KVA:							
		(i)		A Service/basic/availability charge as approved by the National Electricity Regulator from time to time, which shall be payable whether or not any electricity is consumed.	**R932.54**	**R1,072.42**	**R932.54**	**R1,072.42**	
				PLUS					

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		(ii)		A kilovolt ampere (kVA) charge as approved by the National Electricity Regulator from time to time, for kilovolt ampere (kVA) registered during the standard period on a standard Maximum Demand(MD) meter. A minimum monthly charge of 46kva will apply for any demand registered less than 46kva. Demand greater than 46kva will be charged according to the demand registered.	**R120.49**	**R138.56**	**R105.15**	**R120.92**	
				PLUS					
		(iii)		An energy charge (kWh)as approved by the National Electricity Regulator from time to time.	**R1.7893**	**R2.0577**	**R1.5615**	**1.7957**	
				Meters are read at least once after every 2 months. Estimated charges are raised in months where no meter readings are obtained and are adjusted when actual consumption is charged for. If estimated charges are applicable, this is calculated based on a six month prior billing daily average. A security deposit to cover at least 2.5 months' consumption is required					
				Deposit calculated on the required maximum demand, multiplied by the tariff, multiplied by 2.5					
	b)	**TARIFF 3:**							
				Industrial and commercial consumers with a notified maximum demand of less than 65 kVA and all other consumers not incorporated in pursuant of these tariffs.					
		(i)		Service/basic/availability charge per point of connection:					
			a)	A Single Phases connection not exceeding 60 Ampere which shall be payable whether or not any electricity is consumed;	**R358.32**	**R412.07**	**R358.32**	**R412.07**	
			b)	A Three phase connection not exceeding 3 X 80 Ampere which shall be payable whether or not any electricity is consumed;	**R358.32**	**R412.07**	**R358.32**	**R412.07**	
				PLUS					
		(ii)		An energy charge as approved by the National Electricity Regulator from time to time.	**R2.3781**	**R2.7348**	**R2.0753**	**R2.3866**	
		(iii)		Whenever a circuit breaker is replaced with one of the reduced/increased capacity, the consumer requesting such exchange shall be liable for	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	
				Meters are read at least once after every 2 months. Estimated charges are raised in months where no meter readings are obtained and are adjusted when actual consumption is charged for. If estimated charges are applicable, this is calculated based on a six month prior billing daily average. A security deposit to cover at least 2.5 months' consumption is required	**R 5,000.00**		**R 5,000.00**		
	c)	**TARIFF 4:**							
		1A		**Domestic consumers.**					

1. VALUE ADDED TAX MUST BE ADDED TO ALL TARIFFS LISTED BELOW (EXCEPT TO FINES, REFUNDABLE DEPOSITS, INTEREST CHARGES OR WHERE INDICATED AS INCLUSIVE OF VALUE ADDED TAX) 2. ALL APPROVALS OF APPLICATIONS FOR SERVICES LISTED BELOW SHALL BE SUBJECT TO THE APPLICANT OBTAINING A CLEARANCE TO THE EFFECT THAT KWADUKUZA MUNICIPAL ACCOUNTS IN THE NAME OF THE APPLICANT/OWNER ARE NOT IN ARREARS					2021/22 (EXCL VAT)	2021/22 (INCL VAT)	2020/21 (EXCL VAT)	2020/21 (INCL VAT)	COMMENTS
				There shall be payable					
		(i)	A monthly service/basic/availability charge per connection point - as approved by the National Electricity Regulator from time to time, which shall be payable whether or not any electricity is consumed;		**R52.80**	**R60.72**	**R52.80**	**R60.72**	
				PLUS					
		(ii)	An energy charge as approved by the National Electricity Regulator from time to time.		**R2.2070**	**R2.5381**	**R1.9260**	**R2.2149**	
			a)	Energy consumed between ……...0 to 50					
				Energy consumed between ……50 to 350					
				Energy consumed between …..……351 to 600					
				Energy consumed between ……more than 600					
		1B		**Domestic consumers - Indigent**					
		(i)	First 75 kWh free for Indigent Customers and 250 kWh for child headed households qualifying in terms of policies set by Council		**R1.3200**	**R1.5180**	**R1.1507**	**R1.3233**	
		(ii)	Thereafter the cost per kWh shall be as approved by the National Electricity Regulator from time to time		**R1.8053**	**R2.0760**	**R1.5754**	**R1.8117**	
			a)	Energy consumed between ……...0 to 50					
				Energy consumed between ……50 to 350					
				Energy consumed between …..……351 to 600					
				Energy consumed between ……more than 600					
			In the case of the initial exchange of circuit breakers and in the case of any subsequent replacement by circuit breakers of increased or reduced capacity, the cost of exchange shall be		**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	
		2	Meters are read at least once after every 2 months. Estimated charges are raised in months where no meter readings are obtained and are adjusted when actual consumption is charged for. If estimated charges are applicable, this is calculated based on a six month prior billing daily average. A security deposit to cover at least 2.5 months' consumption is required		**R 2,500.000**		**R 2,500.000**		
	d)	**TARIFF 5:**							

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		1A		**Religious and other organizations registered in terms of the act as welfare organizations**					
				There shall be payable					
		(i)	A monthly service/basic/availability charge per connection point - as approved by the National Electricity Regulator from time to time, which shall be payable whether or not any electricity is consumed;		**R 0.000**	**R 0.000**	**R 0.000**	**R 0.000**	
				PLUS					
		(ii)	An energy charge as approved by the National Electricity Regulator from time to time.		**R2.4180**	**R2.7807**	**R2.1102**	**R2.4267**	
			a)	Energy consumed between ……...0 to 50					
				Energy consumed between ……50 to 350					
				Energy consumed between …...……351 to 600					
				Energy consumed between ……more than 600					
		1B		**Religious and other organizations registered in terms of the act as welfare organizations with a notified maximum demand of 65KVA or more, but not exceeding 1000KVA:**					
		(i)	A Service/basic/availability charge as approved by the National Electricity Regulator from time to time, which shall be payable whether or not any electricity is consumed;		**R0.000**	**R0.000**	**R0.000**	**R0.000**	
				PLUS					
		(ii)	A kilovolt ampere (kVA) charge as approved by the National Electricity Regulator from time to time, for kilovolt ampere (kVA) registered during the standard period on a standard Maximum Demand(MD) meter. A minimum monthly charge of 46kva will apply for any demand registered less than 46kva. Demand greater than 46kva will be charged according to the demand registered.		**R120.71**	**R138.81**	**R105.34**	**R121.14**	
				PLUS					
		(iii)	An energy charge (Kwh) as approved by the National Electricity Regulator from time to time		**R1.8927**	**R2.1766**	**R1.6517**	**R1.8995**	
			In the case of the initial exchange of circuit breakers and in the case of any subsequent replacement by circuit breakers of increased or reduced capacity, the cost of exchange shall be		**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	**Cost plus 10%**	

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			Meters are read at least once after every 2 months. Estimated charges are raised in months where no meter readings are obtained and are adjusted when actual consumption is charged for. If estimated charges are applicable, this is calculated based on a six month prior billing daily average. A security deposit to cover at least 2.5 months' consumption is required	**R 2,500.000**		**R 2,500.000**		
			Energy consumed ……more than 600					
	e)	**TARIFF 6:**						
		Approved un-metered supplies for floodlighting, telephone booth lighting and street lighting.						
		A security deposit to cover at least 2 months' consumption is required						
		The following formula and tariffs shall apply to all unmetered supplies for floodlighting, street lighting,						
			Monthly Charge = W x 4000 x Tariff Divide by 1000 x 12					
			W = Total lamp wattage of the installation					
			4000 = Annual burning hours					
			1000 = Converting watt to kW					
			12 = Converting annual hours to monthly hours					
		(i)	Installation Maintained by customer					
			Energy charge per kWh	**R2.5511**	**R2.9338**	**R2.2263**	**R2.5602**	
			Per pole - new	**R95.53**	**R109.86**	**R83.36**	**R95.87**	
			Per pole up to 200kW	**R343.58**	**R395.11**	**R299.83**	**R344.80**	
			Per pole greater than 200Kw	**R402.18**	**R462.50**	**R350.97**	**R403.62**	
			Per Traffic Controller per signal head	**R402.18**	**R462.50**	**R350.97**	**R403.62**	
		(ii)	Installation Maintained by Municipality					
			Energy charge per kWh	**R2.5511**	**R2.9338**	**R2.2263**	**R2.5602**	
			Per pole up to 200kW	**R343.58**	**R395.11**	**R299.83**	**R344.80**	
			Per pole up greater than 200Kw	**R402.18**	**R462.50**	**R350.97**	**R403.62**	
			Per Traffic Controller per signal head	**R402.18**	**R462.50**	**R350.97**	**R403.62**	
		(iii)	A charge per floodlight, telephone booth lighting and street lighting where the maintenance is maintained by Council as approved by the National Electricity Regulator from time to time, per pole shall be	**R402.18**	**R462.50**	**R350.97**	**R403.62**	
		(iv)	These lights shall operate with the Council's streetlights and any expenses incurred by the Council on the maintenance of such installation shall be recoverable from the consumer . The consumer may, at the discretion of the Engineer be required to provide material (spares)	**R402.18**	**R462.50**	**Cost plus 10%**	**Cost plus 10%**	

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		(v)	A charge per floodlight, telephone booth lighting and street lighting where the maintenance is maintained by the customer as approved by the National Electricity Regulator from time to time, per pole shall be		**R402.18**	**R462.50**	**R350.97**	**R403.62**	
		(vi)	A charge per traffic controller installation per signal head, shall be		**R402.18**	**R462.50**	**R350.97**	**R403.62**	
	f)	Approved unmetered low consumption installations.							
		(i)	A security deposit to cover at least 2 months' consumption is required						
			Such as 2 way radio installations; road traffic counter installation; water reservoir level indicators; security cameras, boom controls;						
				Per installation	**R402.18**	**R462.50**	**R350.97**	**R403.62**	
		(ii)	Illuminated advertising signs						
			Basic monthly charge		**R341.79**	**R393.06**	**R341.79**	**R393.06**	
			Energy charge as approved by the National Electricity Regulator from time to time		**R2.3528**	**R2.7057**	**R2.0532**	**R2.3612**	
	g)	**TARIFF 7:**							
		(aa)	Sappi Fine Paper by agreement				**By agreement - aligned to Eskom tariffs.**		
			1	Basic Monthly Charge					
			(i)	**HIGH Seasons:** Demand tariff per month as approved by the National Electricity Regulator from time to time.	**R42.21**		**R35.83**	**R41.20**	
			(ii)	**LOW Season:** Demand tariff per month as approved by the National Electricity Regulator from time to time.	**R42.21**		**R35.83**	**R41.20**	
				PLUS					
			2	A Kwh energy charge as approved by the National Electricity Regulator from time to time.					
			(i)	Energy Charge : **Low Season : Off Peak**	**R0.6188**	**R0.7116**	**R0.5253**	**R0.6041**	
			(ii)	Energy Charge : **Low Season : Standard**	**R0.9756**	**R1.1220**	**R0.8282**	**R0.9524**	
			(iii)	Energy Charge : **Low Season : Peak**	**R1.4176**	**R1.6302**	**R1.2034**	**R1.3839**	
			(iv)	Energy Charge : **High Season : Off Peak**	**R0.7148**	**R0.8220**	**R0.6068**	**R0.6978**	

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			(v)	Energy Charge : **High Season : Standard**	**R1.3163**	**R1.5137**	**R1.1174**	**R1.2850**	
			(vi)	Energy Charge : **High Season : Peak**	**R4.3451**	**R4.9968**	**R3.6885**	**R4.2418**	
			3	**Other chrges**					
			(i)	TX Network capacity charge (per KVA)	**R11.24**	**R12.92**	**R9.54**	**R10.97**	
			(ii)	Network capacity charge (per KVA)	**R22.26**	**R25.60**	**R18.90**	**R21.74**	
			(iii)	Network demand charge (per KVA)	**R42.21**	**R48.54**	**R35.83**	**R41.20**	
			(iv)	Reactive Energy charge (per KVAR) - (**High Season)**	**R0.1951**	**R0.2243**	**R0.1656**	**R0.1904**	
			(v)	Ancilliary service charge (per KwH)	**R0.0055**	**R0.0064**	**R0.0047**	**R0.0054**	
			(vi)	Electrification and Rural Network Subsidy Charge	**R0.1080**	**R0.1242**	**R0.0917**	**R0.1055**	
			(vii)	Surcharge (5% of Total (i), (ii), (iii) & (iv))					
			(viii)	Surcharge (15% of Total kwh - Off Peak , Standard & Peak) + (Electrification & Rural Subsidy) + (Ancilliary Service Charge)					
			(ix)	Distribution Loss Charge (0,5% of Total Kwh - Off Peak , Standard & Peak) + (Electrification & Rural Subsidy) + (Ancilliary Service Charge)					
			(ii)	KvA high demand					
			(ii)	Energy low demand					
			(iii)	KvA low demand					
		(bb)	Supplies to large consumers exceeding 1 000 kVA						
			(i)	Basic Monthly charge	**R1,533.60**	**R1,763.64**	**R1,533.60**	**R1,763.64**	
			(ii)	A Demand tariff per month as approved by the National Electricity Regulator from time to time, for kilovolt ampere (kva) registered. A minimum monthly charge of 700kva will apply for any demand registered less than 700kva. Demand registered greater than 700kva will be charged according to the demand.	**R104.87**	**R120.60**	**R91.52**	**R105.25**	

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				PLUS					
			(iii)	an energy charge during the off peak/Low demand period as approved by the National Electricity Regulator from time to time	**R1.82**	**R2.10**	**R1.59**	**R1.83**	
				PLUS					
			Meters are read at least once after every 2 months. Estimated charges are raised in months where no meter readings are obtained and are adjusted when actual consumption is charged for. If estimated charges are applicable, this is calculated based on a six month prior billing daily average. A security deposit to cover at least 2.5 months' consumption is required						
			Deposit calculated on the required maximum demand, multiplied by the tariff, multiplied by 2.5						
	H	**TARIFF 8:**							
				Premises equipped with Budget Energy Control Metering system					
		(i)	First 75 kWh free for Indigent Customers and 250 kWh for child headed households qualifying in terms of policies set by Council		**R1.38**	**R1.59**	**R1.2060**	**R1.3869**	
		(ii)	Thereafter the cost per kWh shall be as approved by the National Electricity Regulator from time to time, and shall be payable in advance.		**R2.0843**	**R2.3969**	**R1.8189**	**R2.0917**	
			a)	Energy consumed between ……...0 to 50					
				Energy consumed between ……50 to 350					
				Energy consumed between …...……351 to 600					
				Energy consumed between ……more than 600					
		(iii)	Domestic other than registered indigent customers - the cost per kWh shall be as approved by the National Electricity Regulator from time to time and shall be payable in advance per kWh be		**R2.0843**	**R2.3969**	**R1.8189**	**R2.0917**	
			a)	Energy consumed between ……...0 to 50					
				Energy consumed between ……50 to 350					
				Energy consumed between …...……351 to 600					
				Energy consumed between ……more than 600					
		(iv)	Commercial Prepaid metering		**R2.5974**	**R2.9870**	**R2.2667**	**R2.6067**	
			Customers on conventional type Maximum Demand metering cannot convert to prepaid metering						
	I	**TARIFF 9:**							

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		1A		**TOU Industrial, Commercial and other customers with a notified maximum demand greater than 65kVa including shops, factories, hostels, boarding houses, restaurants, office buildings and residential buildings in which individual units are not separetely metered.**					
		(i)		Basic Monthly charge	**R1,533.60**	**R1,763.64**	**R1,533.60**	**R1,763.64**	
		(ii)		Peak	**R5.1952**	**R5.9744**	**R4.5337**	**R5.2138**	
		(iii)		Standard	**R2.1334**	**R2.4535**	**R1.8618**	**R2.1411**	
		(iv)		Off peak	**R1.1559**	**R1.3292**	**R1.0087**	**R1.1600**	
		(v)		Demand tariff per kVa as approved by the National Electricity Regulator from time to time,	**R91.93**	**R105.72**	**R80.23**	**R92.26**	
		1B		**Seasonal - TOU Industrial, Commercial and other customers with a notified maximum demand greater than 65kVa including shops, factories, hostels, boarding houses, restaurants, office buildings and residential buildings in which individual units are not separetely metered.**					
		(i)		Basic Monthly charge	**R1,533.60**	**R1,763.64**	**R1,533.60**	**R1,763.64**	
		(ii)		HIGH Season: Demand tariff per kVa as approved by the National Electricity Regulator from time to time,	**R91.93**	**R105.72**	**R80.23**	**R92.26**	
		(iii)		LOW Season: Demand tariff per kVa as approved by the National Electricity Regulator from time to time.	**R91.93**	**R105.72**	**R80.23**	**R92.26**	
				PLUS					
		2		an energy charge during the off peak/**Low demand period** as approved by the National Electricity Regulator from time to time					
		(i)		Energy charge: Low Season: Off Peak	**R0.9197**	**R1.0577**	**R0.8026**	**R0.9230**	
		(ii)		Energy charge: Low Season: Standard	**R1.3992**	**R1.6091**	**R1.2211**	**R1.4042**	
		(iii)		Energy charge: Low Season: Peak	**R2.1307**	**R2.4503**	**R1.8594**	**R2.1383**	
		(iv)		Energy charge: High Season: Off Peak	**R1.1558**	**R1.3292**	**R1.0087**	**R1.1600**	
		(v)		Energy charge: High Season: Standard	**R2.1335**	**R2.4535**	**R1.8618**	**R2.1411**	

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		(vi)		Energy charge: High Season: Peak	**R5.1952**	**R5.9745**	**R4.5337**	**R5.2138**	
			Meters are read at least once after every 2 months. Estimated charges are raised in months where no meter readings are obtained and are adjusted when actual consumption is charged for. If estimated charges are applicable, this is calculated based on a six month prior billing daily average. A security deposit to cover at least 2.5 months' consumption is required						
				Any meter conversions relating to Tariff 9 shall be for the account of the applicant.					
				Deposit calculated on the required maximum demand, multiplied by the tariff, multiplied by 2.5					
	Where no consumer agreements exist, the registered owner/owners of the property concerned shall be responsible for a minimum monthly charge as defined in the tariffs 1 to 7 above								
	J	**TARIFF 10:**							
				TOU Industrial, Commercial and other customers with a notified maximum demand of less than 65kVa including shops, factories, hostels, boarding houses, restaurants, office buildings and residential buildings in which individual units are not separetely metered.					
		(i)		Basic Monthly charge	**R1,533.60**	**R1,763.64**	**R1,533.60**	**R1,763.64**	
				PLUS					
				A kilovolt ampere (kVA) charge as approved by the National Electricity Regulator from time to time, for kilovolt ampere (kVA) registered during the standard period on a standard Maximum Demand(MD) meter. A minimum monthly charge of 46kva will apply for any demand registered less than 46kva. Demand greater than 46kva will be charged according to the demand registered.	**R120.50**	**R138.57**	**R105.16**	**R120.93**	
				PLUS					
				an energy charge of:					
		(ii)		Energy charge: Off Peak	**R0.698**	**R0.802**	**R0.609**	**R0.700**	

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		(iii)		Energy charge: Standard	**R1.415**	**R1.627**	**R1.235**	**R1.420**	
		(iv)		Energy charge: Peak	**R4.482**	**R5.155**	**R3.912**	**R4.499**	
				Any meter conversions relating to Tariff 10 shall be for the account of the applicant.					
			Meters are read at least once after every 2 months. Estimated charges are raised in months where no meter readings are obtained and are adjusted when actual consumption is charged for. If estimated charges are applicable, this calculated based on a six month prior billing daily average. A security deposit to cover at least 2.5 months' consumption is required						
			Deposit calculated on the required maximum demand, multiplied by the tariff, multiplied by 2.5						
	K	**TARIFF 11:**							
				TOU : RESIDENTIAL					
		(i)		Basic Monthly charge	**R93.87**	**R107.96**	**R93.87**	**R107.96**	
				PLUS					
				an energy charge during the off peak/**Low demand period** as approved by the National Electricity Regulator from time to time					
		(i)		Energy charge: Off Peak	**R1.203**	**R1.383**	**R1.050**	**R1.207**	
		(ii)		Energy charge: Standard	**R1.625**	**R1.869**	**R1.418**	**R1.631**	
		(iii)		Energy charge: Peak	**R3.250**	**R3.738**	**R2.837**	**R3.262**	
				Any meter conversions relating to Tariff 11 shall be for the account of the applicant.					
				Meters are read at least once after every 2 months. Estimated charges are raised in months where no meter readings are obtained and are adjusted when actual consumption is charged for. If estimated charges are applicable, this is calculated based on a six month prior billing daily average. A security deposit to cover at least 2.5 months' consumption is required					
			Deposit calculated on the required maximum demand, multiplied by the tariff, multiplied by 2.5						

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X1.8	**ELECTRICITY AVAILABILITY CHARGE**								
		In respect of any approved subdivision, with or without improvements, which is not connected to the Council's electricity scheme and which can reasonably be so connected, the owner shall pay to the Council an electricity availability charge as stipulated hereunder, in accordance with the Electricity By-Laws Item 18(1) provided that							
	a)	No charge shall be made against any subdivision which exceeds 2 ha;							
	b)	No charge shall be made against any property complying with the requirements of Section 17 (1) (i) of the Municipal Property Rates Act, No 6 of 2004							
	c)	No charge shall be made against one subdivision which is used for bona fide gardening purposes in conjunction with an adjoining subdivision on which there is erected a dwelling house which is connected to the Council's electricity scheme, if such subdivision is owned by the same person or the spouse of the person who owns such dwelling house;							
	d)	In any area where no town planning scheme in terms of the Ordinance 27 of 1949 is in existence, the charge shall be levied as if such property is zoned for special residential use.							
	e)	Depending on the zoning of such subdivision in terms of any town planning scheme in force from time to time, the monthly charges per subdivision shall be as follows:							
		(I)	Irrespective of the zoning of the property there shall be payable a monthly charge of			**R122.61**	**R141.00**	**R115.50**	**R132.83**	
				If zoned for other purposes		**R122.61**	**R141.00**	**R115.50**	**R132.83**	
X1.9	**GENERAL PROVISIONS**								
	a)			**Notified maximum demand:**					
		(I)	Every existing consumer with an installed load in excess of 60 A shall, when called upon to do so, notify the Council in writing of the maximum which he requires the Council to supply.							
		(ii)	Every new consumer requiring a supply of electricity in excess of 60A single phase or 20A three-phase shall give three months prior written notice of his requirements; provided that the period of notice may be reduced at the discretion of the Engineer.							

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		(iii)	Every existing consumer who wishes to increase his installed load shall give the Council three months prior written notice of his requirements, provided that the period of notice may be reduced at the discretion of the Engineer.					
		(iv)	With effect from the date on which the Council is in a position to meet the notified requirements or the date stipulated in the notice given under paragraph (bb) or (cc), whichever is the later, the amperage charge or the maximum demand charge applicable to such consumer shall be adjusted accordingly.					
		(v)	In the event of the actual consumption of any consumer exceeding his notified maximum demand, the Engineer may call upon such consumer to negotiate an increased notified maximum demand in terms of this Bylaw. Should such consumer fail to notify the Board of his increased requirements within thirty (30) days of being called upon to do so, the Engineer, after inspection of the consumer's installation may notify the Town Treasurer of such increased notified maximum demand as should, in his opinion apply to such consumer for accounting purposes and the charges therefore shall be adjusted accordingly.					
	b)	**Bulk Supply Installation**						
		(I)	Where the joint requirements of any two or more consumers necessitate, in the opinion of the Engineer, the specific installation of one or more transformers together with associated switch gear , such consumers shall jointly be responsible for the cost of such installation, in proportion to their individual requirements.					
		(ii)	In designing such a bulk supply installation, as provided for under item (i) above, it shall be competent for the Council to install a transformer with a larger capacity than that called for by the applicant, provided that					
		(iii)	The amount payable by the Applicant shall be pro-rated accordingly : and Council shall have the right to use any such excess capacity for such other needs as it deems fit.					
		(iv)	In respect of all bulk installations the applicant shall be required to provide a chamber, to the Council's requirements, in which any such transformers, switch gear and equipment shall be accommodated.					

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		(v)	Where application is made for an increased supply and sufficient spare capacity exists on the transformer of greater capacity, the consumer shall in addition to the charges as provided for in these by-laws, be charged the pro-rata cost of the additional transformer capacity based upon the cost of a new transformer or Mini Sub Station of that capacity at that time, plus 10%.						
X1.10	**REDUNDANT STREETLIGHT POLES**								
	a)	Whole poles, as is, per meter				**R41.44**	**R47.65**	**R39.09**	**R44.96**	
				(Maximum of 60 meters per person)						
Z 1	**SURCHARGE**									
		The Council may, by resolution, in respect of all consumers enforce a surcharge by means of a percentage on the total of the various tariffs, provided that such surcharge shall at no time exceed 50 (fifty) percentum.								
				COMPILED BY :						
				T P GUMEDE						
				N SINGH						
				CHECKED BY:						

ANNEXURE 5

NERSA Distribution Forms

National Energy Regulator of South Africa

Electricity Distribution Form
Financial Information
Introduction

Completed form to be returned to NERSA no later than:	**31-Oct-19**
Financial year reporting on:	**Financial year ending 30 June 2019**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
Completed D-Forms may be returned to one of the following addresses:	Email : dforms@nersa.org.za Post: P O Box 40343, Arcadia, 0007 Fax: (012) 401-4700
D-Forms are available: 1. On the NERSA website: 2. In the following formats	www.nersa.org.za Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	**Initials**	**Last Name**	**Telephone number**	**Fax number**	**Email address**
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Municipal Manager:	**Mr**	**NJ**	**Mdakane**	**032 437 5015**	**032 551 4274**	lindon@kwadukuza.gov.za
Chief Financial Officer:	**Mr**	**SM**	**Rajcoomar**	**032 437 5505**	**032 551 4274**	Shamirr@kwadukuza.gov.za
Contact Person:	**Mrs**	**C**	**Moodley**	**032 437 5573**	**032 551 4274**	Cindym@kwadukuza.gov.za

	Verification of the entire document and authorization by Senior Management							
	Income Statement		**Expenditure Statement**		**Purchases of Electricity**	**Sales of Electricity**		
	Total Revenue Derived From Electricity Distribution	**Revenue From Sale of Electricity**	**Total Expenditure**	**Energy Purchases**	**Total Energy Purchased**	**Total Energy Sales**	**Total Number of Consumers**	**Please include hand signature and the date below by Senior Management as an authorization that these numbers are correct and can be released to NERSA for processing.**
Municipal Manager:	848,985,461	789,156,099	744,424,801	630,318,190	674,809,144 kWh	554,753,164 kWh	60,011	**Sign here and include the date:**
Chief Financial Officer:	848,985,461	789,156,099	744,424,801	630,318,190	674,809,144 kWh	554,753,164 kWh	60,011	**Sign here and include the date:**

Summary			
Revenue from sale of electricity over total revenue derived from electricity distribution %	Cost of energy purchases over total expenditure %	Energy losses %	Repairs and maintenance over revenue from sales of electricity %
93%	85%	17.79%	2%

Electricity Distribution Form

Financial Information
(D1 Form: Balance Sheet)

Completed form to be returned to NERSA no later than:	**31-Oct-19**
Financial year reporting on:	**Financial year ending 30 June 2019**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
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	Licensee Contact Person					
	Title (Ms/ Mr)	**Initials**	**Last Name**	**Telephone number**	**Fax number**	**Email address**
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**MR**	**P**	**Murugan**	**0790223746**	**0865062318**	poobalanm@kwadukuza.gov.za

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity. This should ensure that the revenues, costs, assets, liabilities, reserves and provisions are separately identifiable from those of any other business in the books of account of the licensee. The information required is based on the financial accounts for the financial year ending 30 June 2019 and the budget figures for the financial year ending 30 June 2019.

Please Complete the following:

Capital Employed		**Actual 2018/19**
Funds & reserves		0
Statutory funds	0	
Reserves	0	
(Accumulated deficit) Retained surplus		631,330,952
Trust funds		0
Long-term liabilities		199,339,202
Consumer deposits		33,500,617
Total		864,170,771
		864,170,771

Employment of Capital - Electricity Distribution Account			**Actual 2018/19**
Fixed assets			577,867,811
Buildings & other fixed assets		0	
Electricity distribution network and equipment		577,867,811	
Other (please specify below):			0
Type here		0	
Type here		0	
Type here		0	
Investments			0
Long-term debtors			0
Deferred charges			0
Total			577,867,811
NET CURRENT ASSETS / LIABILITIES			286,302,960

Current Assets		**Actual 2018/19**
Inventory		4,811,229
Debtors (a) + (b)		103,570,768
Less than 90 days (a)	88,114,049	
90 days or more (b)	15,456,719	
Cash		226,375,671
Short-term investments		53,102,739
Short-term portion of long-term debtors		0
Total		387,860,407

Current Liabilities	**Actual 2018/19**
Provisions	3,193,196
Creditors: Eskom	76,111,913
Creditors: Other	15,244,800
Short-term portion of long-term liabilities	7,007,538
Bank overdraft	0
Total	101,557,447

Electricity Distribution Form

Financial Information

(D1 Form: Income Statement)

Completed form to be returned to NERSA no later than:	**31-Oct-19**
Financial year reporting on:	**Financial year ending 30 June 2019**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
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D-Forms are available:	
1. On the NERSA website:	www.nersa.org.za
2. In the following formats	Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	Initials	Last Name	Telephone number	Fax number	Email address
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	**dforms@nersa.org.za**
Contact Person:	**Mr**	**P**	**Murugan**	**0790223746**	**0865062346**	**Poobalanm@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity.

Please complete the following:

Your check list	**Actual 2018/19**	**Budget 2019/20**
Revenue section	**Completed**	**Completed**
Expenditure section	**Completed**	**Completed**

REVENUE:

Revenue from sale of electricity to the following consumers:	**Actual 2018/19**	**Budget 2019/20**
Domestic (pre-paid)	113,155,828	127,866,085
Domestic (conventional)	209,311,751	236,522,278
Agriculture	Type here	Type here
Mining & quarrying	Type here	Type here
Manufacturing / Industrial	Type here	Type here
Commercial (pre-paid)	26,319,720	29,741,284
Commercial (conventional)	430,243,058	486,174,655
Transport	Type here	Type here
Redistributors/Resellers	Type here	Type here
Other consumers (please specify below)	0	0
1.	Type here	Type here
2.	Type here	Type here
3.	Type here	Type here
4.	Type here	Type here
Total	779,030,356	880,304,302

Revenue from street lighting & sold to other municipal departments	**Actual 2018/19**	**Budget 2019/20**
Street lighting	8,106,244	9,160,055
Sold to other municipal departments	2,019,499	2,282,034
Total	10,125,742	11,442,089

Other Income	**Actual 2018/19**	**Budget 2019/20**
Reconnection fees	753,762	317,700
New connections	5,121,666	5,428,966
Free Basic Electricity(Equitable share)	17,350,000	20,777,863
Other revenue (Please specify below)	36,603,935	26,880,175
Interest on investments	15,947,772	9,286,452
Demand based contribution	15,932,241	12,266,401
Sundry Income	4,723,922	5,327,322
6.	Type here	Type here
Other Income	59,829,363	53,404,704

EXPENSES:

Electricity Purchases from:	**Actual 2018/19**	**Budget 2019/20**
Eskom	630,318,190	737,000,000
Independent Power Producers Conventional	Type here	Type here
Independent Power Producers Renewable Energy	Type here	Type here
Self Generation	Type here	Type here
Other	Type here	Type here
Total	630,318,190	737,000,000

Repairs, Maintenance and Salaries	**Actual 2018/19**	**Budget 2019/20**
Repairs and Maintenance:	15,352,312	24,275,257
1. Salaries and allowances	0	Type here
2. Materials and supplies	7,824,074	12,277,025
3. Contracted Services	7,528,238	11,998,232
Salaries, wages and allowances including payments to consultants		
1. Salaries, wages and allowances (Excl. Repairs and Maintenance)	44,203,793	57,565,814
2. Payments to consultants (operational work)	Type here	Type here
Total	59,556,105	81,841,071

Financial Costs	**Actual 2018/19**	**Budget 2019/20**
Interest		
Total	0	0

Notified Maximum Demand Costs	**Actual 2018/19**	**Budget 2019/20**
NMD Costs	170,612	Type here
Total	170,612	0

Other Expenses	**Actual 2018/19**	**Budget 2019/20**
Bad debts	768,760	6,972,476
FBE paid to Eskom	9,252,988	20,777,863
Charges from other Municipal Departments	Type here	Type here
General Expenses (please specify below) (Group into 6-main categories)	44,358,146	52,613,885
1.Depreciation	22,113,233	27,891,821
2.Collection Costs (commision on electricity vending)	7,514,493	Type here
3.interest	14,730,420	9,600,000
4.		15,122,064
5.	Type here	Type here
6.	Type here	Type here
Total	54,379,894	80,364,224

Summary Stats (for office use)		
Total Income	**Actual 2018/19**	**Budget 2019/20**
	848,985,461	945,151,095
Surplus	**104,560,660**	**45,945,800**

	Actual 2018/19	**Budget 2019/20**
Total Expenditure	744,424,801	899,205,295

Electricity Distribution Form

Market Information

(D2 Form: Market)

Completed form to be returned to NERSA no later than: 31-Oct-19
Financial year reporting on: Financial year ending 30 June 2019
Full name of Licensee KWADUKUZA MUNICIPALITY
Licence number NER/D/KZ292
Enquiries: Veli Mahlangu (Senior Statistician)
Thilivhali Nthakheni (Financial Regulat
dforms@nersa.org.za
(012) 401-4600

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Email : **dforms@nersa.org.za**
Post: P O Box 40343, Arcadia, 0007
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2. In the following formats Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	Initials	Last Name	Telephone number	Fax number	Email address
Example	Ms	L	Mkhize	0124014710	0124014700	dforms@nersa.org.za
Contact Person:	Ms	N	Singh	0844080571	0865062318	nisharas@kwadukuza.gov.za

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity.

The kWh losses are calculated as follows: $\frac{kWh\ Purchased\ and\ Generated - kWh\ Sold}{kWh\ Purchased\ and\ Generated} \times 100\%$

The average system load factor is calculated as follows: $\frac{kWh\ Purchased\ and\ Generated\ in\ the\ Month}{Monthly\ Maximum\ Demand\ in\ kWh \times Number\ of\ hours\ in\ the\ month} \times 100\%$

The system power factor is calculated as follows: $\frac{\text{True Power (P)}}{\text{Apparent Power (S)}}$

Please complete the following:

	Peak monthly maximum demand		Energy purchased by the licensee		Average Demand Charge				Average Energy Charge	
	Actual 2018/19	Budget 2019/20	Actual 2018/19	Budget 2019/20	Actual 2018/19		Budget 2019/20		Actual 2018/19	Budget 2019/20
Eskom	3,745,494	4,120,043	674,809,144	742,290,059	29	R/kVA/month	29	R/kVA/month	93.41 c/kWh	99.29 c/kWh
Independent Power Producers Conventional	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Independent Power Producers Renewable Energy	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Self Generation	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Other	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Total	3,745,494	4,120,043	674,809,144 kWh	742,290,059 kWh	29	R/kVA/month	29	R/kVA/month	93.40688328 c/kWh	99.28733267 c/kWh

Electricity sold by the licensee to consumers

	Number of consumers			Sales (kWh)				Average Energy Charge (c/kWh)		Licensee check list	
Consumer classification	Actual 2018/19	Budget 2019/20	Estimate 2020/21	Actual 2018/19	Budget 2019/20	Estimate 2020/21		Actual 2018/19	Budget 2019/20	Actual 2018/19	Budget 2019/20
Free Basic Electricity	9,299	9,299	10,229	8,296,542	9,126,196	10,038,816	kWh				
Domestic (pre-paid)	46,830	46,830	51,513	78,301,215	86,131,337	94,744,471	kWh	144.51	148.45		
Domestic (conventional)	10,814	10,814	11,895	124,323,584	136,755,942	150,431,537	kWh	168.36	172.95		
Agriculture	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Mining & quarrying	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Manufacturing / Industrial	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Commercial (pre-paid)	475	523	575	17,729,029	19,501,932	21,452,125	kWh	148.46	152.50		
Commercial (conventional)	1,841	2,025	2,228	333,417,335	366,759,069	403,434,976	kWh	129.04	132.56		
Transport	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Other consumers	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Redistributors/Resellers	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Electricity Department	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Street lighting				Type here	Type here	Type here	kWh				
Sold to other municipal departments	51	56	62	982,001	1,080,201	1,188,221	kWh	205.65	211.26		
Total	60,011	60,248	66,272	554,753,164 kWh	610,228,481 kWh	671,251,329	kWh	142.25	146.13		

System factors	Actual 2018/19	Budget 2019/20
Average system load factor	65	71
Average system power factor	Type here	Type here
Energy losses kWh	17.79%	17.79%

Electricity Distribution Form

Human Resources Information
(D3 Form: HR)

Completed form to be returned to NERSA no later than:	**31-Oct-19**
Financial year reporting on:	**Financial year ending 30 June 2019**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
Completed D-Forms may be returned to one of the following addresses:	Email : **dforms@nersa.org.za** Post: P O Box 40343, Arcadia, 0007 Fax: (012) 401-4700
D-Forms are available:	
1. On the NERSA website:	www.nersa.org.za
2. In the following formats	Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	**Initials**	**Last Name**	**Telephone number**	**Fax number**	**Email address**
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**Mr**	**SM**	**Jali**	**0324375087**	**0867338189**	**SibusisoJ@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity. **Only include information of personnel who are working in the Electricity Department e.g. (Electricity Technicians)**.

Please complete the following:

	ACTUAL 2018/19	
Level	**Number of Technical Staff**	**Number of Non-Technical Staff**
Management	**6**	Type here
Skilled Labour	**17**	**12**
Unskilled Labour	**49**	**3**
Trainees	**0**	**0**
Total staff	72	15
Vacancies	**61**	**1**

Grand total	**149**

Electricity Distribution Form

Tariff Information

(D6 Form: Tariffs)

Completed form to be returned to NERSA no later than:	**31-Oct-19**
Financial year reporting on:	**Financial year ending 30 June 2019**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
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	Licensee Contact Person					
	Title (Ms/ Mr)	Initials	Last Name	Telephone number	Fax number	Email address
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**Ms**	**N**	**Singh**	**084080571**	**0865062318**	**nisharas@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity.

Please complete the following:

		Click on a cell for code										
Tariff Name	**Tariff Number**	**SIC** (code)	**Load profile** (code)	**Tariff structure** (code)	**Number of consumers**	**Energy Sales**	**Revenue derived from energy charges**	**Revenue derived from demand charges**	**Revenue derived from fixed charge**	**Revenue**	**Extra municipal surcharge**	
Industrial Low Voltage	1	0	1	5.1	720	102,841,068 kWh	173,354,619	Type here	Type here	173,354,619	Type here	%
Domestic/ Sectional titles	2	0	2	5.1	225	22,766,493 kWh	37,135,804	Type here	Type here	37,135,804	Type here	%
Commercial conventional	3	6	4	5.1	1,061	21,501,464 kWh	37,034,467	Type here	Type here	37,034,467	Type here	%
Domestic customers conventional	4 (1a)	0	1	5.1	10,347	100,645,649 kWh	170,943,705	Type here	Type here	170,943,705	Type here	%
Domestic Conventional Indigent	4 (1b)	0	1	5.1	242	911,442 kWh	1,232,242	Type here	Type here	1,232,242	Type here	%
Domestic Religious org	5	0	1	5.1	52	491,811 kWh	892,740	Type here	Type here	892,740	Type here	%
Street lighting	6	4	1	5.1	33	3,082,107 kWh	8,106,244	Type here	Type here	8,106,244	Type here	%
Industrial >1000 kva - Sappi by agreement	7 (aa)	6	5	5.1	1	134,542,795 kWh	130,589,668	Type here	Type here	130,589,668	Type here	%
Industrial Medium-Commercial >1000 kva	7 (bb)	6	5	5.1	1	555,266 kWh	1,063,739	Type here	Type here	1,063,739	Type here	%
Prepaid domestic indigent	8a	0	1	5.1	9,057	7,385,100 kWh	7,876,948	Type here	Type here	7,876,948	Type here	%
Prepaid domestic low	8a	0	1	5.1	37,773	70,916,115 kWh	105,278,880	Type here	Type here	105,278,880	Type here	%
Prepaid Commercial	8b	6	4	5.1	475	17,729,029 kWh	26,319,720	Type here	Type here	26,319,720	Type here	%
Non STD Industrial	9	6	6	5.1	21	71,085,595 kWh	88,977,936	Type here	Type here	88,977,936	Type here	%
Industrial, Commercial & Other <65 kva	10	6	5	5.1	3	299,229 kWh	349,388	Type here	Type here	349,388	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here	%
Total					**60,011**	**554,753,163** kWh	**789,156,099**	**0**	**0**	**789,156,099**		

National Energy Regulator of South Africa

Electricity Distribution Form

Financial Information

Introduction

Completed form to be returned to NERSA no later than:	**31 October 2020**
Financial year reporting on:	**Financial year ending 30 June 2020**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
Completed D-Forms may be returned to one of the following addresses:	Email : dforms@nersa.org.za Post: P O Box 40343, Arcadia, 0007 Fax: (012) 401-4700
D-Forms are available: 1. On the NERSA website: 2. In the following formats	www.nersa.org.za Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	**Initials**	**Last Name**	**Telephone number**	**Fax number**	**Email address**
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Municipal Manager:	**Mr**	**NJ**	**Mdakane**	**032 437 5015**	**032 551 4274**	lindon@kwadukuza.gov.za
Chief Financial Officer:	**Mr**	**SM**	**Rajcoomar**	**032 437 5505**	**032 551 4274**	Shamirr@kwadukuza.gov.za
Contact Person:	**Mrs**	**C**	**Moodley**	**032 437 5573**	**032 551 4274**	Cindym@kwadukuza.gov.za

	Verification of the entire document and authorization by Senior Management							
	Income Statement		Expenditure Statement		Purchases of Electricity	Sales of Electricity		
	Total Revenue Derived From Electricity Distribution	**Revenue From Sale of Electricity**	**Total Expenditure**	**Energy Purchases**	**Total Energy Purchased**	**Total Energy Sales**	**Total Number of Consumers**	**Please include hand signature and the date below by Senior Management as an authorization that these numbers are correct and can be released to NERSA for processing.**
Municipal Manager:	921,588,959	843,825,834	849,168,702	716,028,548	655,647,276 kWh	518,350,108 kWh	61,705	**Sign here and include the date:**
Chief Financial Officer:	921,588,959	843,825,834	849,168,702	716,028,548	655,647,276 kWh	518,350,108 kWh	61,705	**Sign here and include the date:**

Summary			
Revenue from sale of electricity over total revenue derived from electricity distribution %	Cost of energy purchases over total expenditure %	Energy losses %	Repairs and maintenance over revenue from sales of electricity %
92%	84%	20.94%	3%

Electricity Distribution Form

Financial Information
(D1 Form: Balance Sheet)

Completed form to be returned to NERSA no later than:	**31 October 2020**
Financial year reporting on:	**Financial year ending 30 June 2020**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
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	Licensee Contact Person					
	Title (Ms/ Mr)	Initials	Last Name	Telephone number	Fax number	Email address
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**MR**	**P**	**Murugan**	**0790223746**	**0865062318**	poobalanm@kwadukuza.gov.za

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity. This should ensure that the revenues, costs, assets, liabilities, reserves and provisions are separately identifiable from those of any other business in the books of account of the licensee. The information required is based on the financial accounts for the financial year ending **30 June 2020** and the budget figures for the financial year ending **30 June 2021.**

Please Complete the following:

Capital Employed		Actual 2019/20
Funds & reserves		**0**
Statutory funds	Type here	
Reserves	Type here	
(Accumulated deficit) Retained surplus		**940,181,583**
Trust funds		Type here
Long-term liabilities		**131,135,609**
Consumer deposits		**35,326,269**
Total		**1,106,643,461**

Employment of Capital - Electricity Distribution Account			Actual 2019/20
Fixed assets			**632,613,898**
Buildings & other fixed assets		**93,698,940**	
Electricity distribution network and equipment		**538,914,958**	
Other (please specify below):			**0**
Type here		Type here	
Type here		Type here	
Type here		Type here	
Investments			Type here
Long-term debtors			Type here
Deferred charges			Type here
Total			**632,613,898**

NET CURRENT ASSETS / LIABILITIES			**474,029,563**

Current Assets		Actual 2019/20
Inventory		**3,757,098**
Debtors (a) + (b)		**117,070,102**
Less than 90 days (a)	**101,828,213**	
90 days or more (b)	**15,241,889**	
Cash		**386,073,610**
Short-term investments		**86,339,806**
Short-term portion of long-term debtors		Type here
Total		**593,240,616**

Current Liabilities	Actual 2019/20
Provisions	**19,684,694**
Creditors: Eskom	**91,920,362**
Creditors: Other	Type here
Short-term portion of long-term liabilities	**7,605,997**
Bank overdraft	Type here
Total	**119,211,053**

	1,106,643,461

Electricity Distribution Form

Financial Information

(D1 Form: Income Statement)

Completed form to be returned to NERSA no later than:	**31 October 2020**
Financial year reporting on:	**Financial year ending 30 June 2020**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
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D-Forms are available:	
1. On the NERSA website:	www.nersa.org.za
2. In the following formats	Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	Initials	Last Name	Telephone number	Fax number	Email address
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**Mr**	**P**	**Murugan**	**0790223746**	**0865062318**	**poobalanm@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity.

Please complete the following:

	Actual	Budget
Your check list	**2019/20**	**2020/21**
Revenue section	**Completed**	**Completed**
Expenditure section	**Completed**	**Completed**

REVENUE:

Revenue from sale of electricity to the following consumers:	Actual 2019/20	Budget 2020/21
Domestic (pre-paid)	126,425,214	126,425,214
Domestic (conventional)	228,708,653	228,708,653
Agriculture	Type here	Type here
Mining & quarrying	Type here	Type here
Manufacturing / Industrial	Type here	Type here
Commercial (pre-paid)	13,284,702	14,111,011
Commercial (conventional)	462,174,648	526,888,926
Transport	Type here	Type here
Redistributors/Resellers	Type here	Type here
Other consumers (please specify below)	0	0
1.	Type here	Type here
2.	Type here	Type here
3.	Type here	Type here
4.	Type here	Type here
Total	830,593,218	896,133,804

Revenue from street lighting & sold to other municipal departments	Actual 2019/20	Budget 2020/21
Street lighting	3,151,936	3,347,986
Sold to other municipal departments	10,080,681	10,080,681
Total	13,232,617	13,428,667

Other Income	Actual 2019/20	Budget 2020/21
Reconnection fees	387,348	500,004
New connections	4,523,945	4,795,381
Free Basic Electricity(Equitable share)	9,433,863	14,110,200
Other revenue (Please specify below)	63,417,969	54,829,332
Interest on investments	26,128,848	17,632,368
Demand based contribution	13,484,249	15,247,716
Sundry Income	4,898,576	2,499,996
Electricity Basic Charges	18,906,296	19,449,252
5.	Type here	Type here
6.	Type here	Type here
Other Income	77,763,125	74,234,917

Summary Stats (for office use)		
Total Income	**Actual 2019/20**	**Budget 2020/21**
	921,588,959	983,797,388
Surplus	**72,420,257**	**34,569,106**

EXPENSES:

Electricity Purchases from:	Actual 2019/20	Budget 2020/21
Eskom	716,028,548	783,288,000
Independent Power Producers Conventional	Type here	Type here
Independent Power Producers Renewable Energy	Type here	Type here
Self Generation	Type here	Type here
Other	Type here	Type here
Total	716,028,548	783,288,000

Repairs, Maintenance and Salaries	Actual 2019/20	Budget 2020/21
Repairs and Maintenance:	26,995,957	37,968,674
1. Salaries and allowances	Type here	Type here
2. Materials and supplies	7,014,763	12,425,714
3. Contracted Services	19,981,194	25,542,960
Salaries, wages and allowances including payments to consultants		
1. Salaries, wages and allowances (Excl. Repairs and Maintenance)	52,292,138	53,444,076
2. Payments to consultants (operational work)	0	0
Total	79,288,095	91,412,750

Financial Costs	Actual 2019/20	Budget 2020/21
Interest	14,193,474	20,234,892
Total	14,193,474	20,234,892

Notified Maximum Demand Costs	Actual 2019/20	Budget 2020/21
NMD Costs	Type here	Type here
Total	0	0

Other Expenses	Actual 2019/20	Budget 2020/21
Bad debts	1,423,074	2,107,152
FBE paid to Eskom	9,412,371	9,882,990
Charges from other Municipal Departments	Type here	Type here
General Expenses (please specify below) (Group into 6-main categories)	28,823,140	42,302,499
Depreciation	22,497,446	34,302,495
Collection Costs (commission on electricity vending)	6,325,694	8,000,004
		0
		0
		0
6.	Type here	Type here
Total	39,658,585	54,292,641

	Actual 2019/20	Budget 2020/21
Total Expenditure	849,168,702	949,228,283

Electricity Distribution Form

Market Information

(D2 Form: Market)

Completed form to be returned to NERSA no later than:	**31 October 2020**
Financial year reporting on:	**Financial year ending 30 June 2020**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulato dforms@nersa.org.za (012) 401-4600
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Contact Person:	**Ms**	**N**	**Singh**	**0844080571**	**0865062318**	**nisharas@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity.

The kWh losses are calculated as follows: $\frac{kWh\ Purchased\ and\ Generated - kWh\ Sold}{kWh\ Purchased\ and\ Generated} \times 100\%$

The average system load factor is calculated as follows: $\frac{kWh\ Purchased\ and\ Generated\ in\ the\ Month}{Monthly\ Maximum\ Demand\ in\ kWh \times Number\ of\ hours\ in\ the\ month} \times 100\%$

The system power factor is calculated as follows: $\frac{\text{True Power (P)}}{\text{Apparent Power (S)}}$

Please complete the following:

	Peak monthly maximum demand		Energy purchased by the licensee		Average Demand Charge				Average Energy Charge	
	Actual 2019/20	Budget 2020/21	Actual 2019/20	Budget 2020/21	Actual 2019/20		Budget 2020/21		Actual 2019/20	Budget 2020/21
Eskom	4,386,478	4,825,126	655,647,276	721,212,004	34	R/kVA/month	Type here	R/kVA/month	109.21 c/kWh	108.61 c/kWh
Independent Power Producers Conventional	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Independent Power Producers Renewable Energy	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Self Generation	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Other	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Total	4,386,478	4,825,126	655,647,276 kWh	721,212,004 kWh	34	R/kVA/month	-	R/kVA/month	109.209414 c/kWh	108.6071774 c/kWh

Electricity sold by the licensee to consumers

	Number of consumers			Sales (kWh)				Average Energy Charge (c/kWh)		Licensee check list	
Consumer classification	Actual 2019/20	Budget 2020/21	Estimate 2021/22	Actual 2019/20	Budget 2020/21	Estimate 2021/22		Actual 2019/20	Budget 2020/21	Actual 2019/20	Budget 2020/21
Free Basic Electricity	8,210	9,031	9,934	7,203,742	7,924,116	8,716,528	kWh				
Domestic (pre-paid)	48,572	51,001	53,551	77,923,591	81,819,771	85,910,759	kWh	162.24	154.52		
Domestic (conventional)	10,632	11,164	11,722	119,444,205	125,416,415	131,687,236	kWh	191.48	182.36		
Agriculture	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Mining & quarrying	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Manufacturing / Industrial	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Commercial (pre-paid)	486	535	588	7,912,835	8,704,119	9,574,530	kWh	167.89	162.12		
Commercial (conventional)	1,891	2,080	2,288	311,321,719	342,453,891	376,699,280	kWh	148.46	153.86		
Transport	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Other consumers	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Redistributors/Resellers	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Electricity Department	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Street lighting				Type here	Type here	Type here	kWh				
Sold to other municipal departments	124	130	137	1,747,758	1,835,146	1,926,903	kWh	576.78	549.31		
Total	61,705	64,909	68,285	518,350,108 kWh	560,229,342 kWh	605,798,709 kWh		162.79	162.36		

System factors	Actual 2019/20	Budget 2020/21
Average system load factor	63	66
Average system power factor	Type here	Type here
Energy losses kWh	20.94%	22.32%

Electricity Distribution Form

Human Resources Information
(D3 Form: HR)

Completed form to be returned to NERSA no later than:	**31 October 2020**
Financial year reporting on:	**Financial year ending 30 June 2020**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
Completed D-Forms may be returned to one of the following addresses:	Email : **dforms@nersa.org.za** Post: P O Box 40343, Arcadia, 0007 Fax: (012) 401-4700
D-Forms are available:	
1. On the NERSA website:	www.nersa.org.za
2. In the following formats	Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	**Initials**	**Last Name**	**Telephone number**	**Fax number**	**Email address**
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**Mr**	**SM**	**Jali**	**0324375087**	**0867338189**	**SibusisoJ@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity. **Only include information of personnel who are working in the Electricity Department e.g. (Electricity Technicians)**.

Please complete the following:

	ACTUAL 2019/20	
Level	**Number of Technical Staff**	**Number of Non-Technical Staff**
Management	**7**	Type here
Skilled Labour	**28**	**1**
Unskilled Labour	**33**	**7**
Trainees	**4**	Type here
Total staff	72	8
Vacancies	**67**	**3**

Grand total	**150**

Electricity Distribution Form

Tariff Information
(D6 Form: Tariffs)

Completed form to be returned to NERSA no later than:	**31 October 2020**
Financial year reporting on:	**Financial year ending 30 June 2020**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
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D-Forms are available:	
1. On the NERSA website:	www.nersa.org.za
2. In the following formats	Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	**Initials**	**Last Name**	**Telephone number**	**Fax number**	**Email address**
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**Ms**	**N**	**Singh**	**0844080571**	**0865062318**	**nisharas@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity.

Please complete the following:

Tariff Name	Tariff Number	SIC (code)	Load profile (code)	Tariff structure (code)	Number of consumers	Energy Sales		Revenue derived from energy charges	Revenue derived from demand charges	Revenue derived from fixed charge	Revenue	Extra municipal surcharge	
		Click on a cell for code											
Industrial Low Voltage	1	0	1	5.1	848	88,333,017	kWh	179,074,100	Type here	Type here	179,074,100	Type here	%
Domestic/ Sectional titles	2	0	2	5.1	213	20,271,671	kWh	38,623,771	Type here	Type here	38,623,771	Type here	%
Commercial conventional	3	6	4	5.1	1,043	19,660,624	kWh	37,899,954	Type here	Type here	37,899,954	Type here	%
Domestic customers conventional	4 (1a)	0	1	5.1	10,235	98,676,867	kWh	189,189,444	Type here	Type here	189,189,444	Type here	%
Domestic Conventional Indigent	4 (1b)	0	1	5.1	184	495,667	kWh	895,439	Type here	Type here	895,439	Type here	%
Domestic Religious org	5	0	1	5.1	53	464,126	kWh	959,323	Type here	Type here	959,323	Type here	%
Street lighting	6	4	1	5.1	39	2,299,081	kWh	3,151,936	Type here	Type here	3,151,936	Type here	%
Industrial >1000 kva - Sappi by agreement	7 (aa)	6	5	5.1	1	127,774,106	kWh	146,195,465	Type here	Type here	146,195,465	Type here	%
Prepaid domestic indigent	8 (i)	0	1	5.1	8,026	6,708,075	kWh	6,862,894	Type here	Type here	6,862,894	Type here	%
Prepaid domestic low	8 (iii)	0	1	5.1	40,546	71,215,516	kWh	119,562,320	Type here	Type here	119,562,320	Type here	%
Prepaid Commercial	8 (iv)	6	4	5.1	486	7,912,835	kWh	13,284,702	Type here	Type here	13,284,702	Type here	%
Non STD Industrial	9	6	6	5.1	27	74,192,041	kWh	107,475,810	Type here	Type here	107,475,810	Type here	%
Industrial, Commercial & Other <65 kva	10	6	5	5.1	4	346,484	kWh	650,678	Type here	Type here	650,678	Type here	%
					Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Type here	Type here	Type here	Type here	Type here	Type here	Type here	kWh	Type here	Type here	Type here	0	Type here	%
Total					**61,705**	**518,350,109**	kWh	**843,825,834**	**0**	**0**	**843,825,834**		

National Energy Regulator of South Africa

Electricity Distribution Form

Financial Information

Introduction

Completed form to be returned to NERSA no later than:	**31 October 2021**
Financial year reporting on:	**Financial year ending 30 June 2021**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
Completed D-Forms may be returned to one of the following addresses:	Email : dforms@nersa.org.za
D-Forms are available: 1. On the NERSA website: 2. In the following formats	www.nersa.org.za Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	**Initials**	**Last Name**	**Telephone number**	**Fax number**	**Email address**
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Municipal Manager:	**Mr**	**NJ**	**Mdakane**	**032 437 5015**	**032 551 4274**	lindon@kwadukuza.gov.za
Chief Financial Officer:	**Mr**	**SM**	**Rajcoomar**	**032 437 5505**	**032 551 4274**	Shamirr@kwadukuza.gov.za
Contact Person:	**Mrs**	**C**	**Moodley**	**032 437 5573**	**032 551 4274**	Cindym@kwadukuza.gov.za

	Verification of the entire document and authorization by Senior Management							
	Income Statement		Expenditure Statement		Purchases of Electricity	Sales of Electricity		
	From Electricity Distribution	**Revenue From Sale of Electricity**	**Total Expenditure**	**Energy Purchases**	**Total Energy Purchased**	**Total Energy Sales**	**Total Number of Consumers**	**Please include hand signature and the date below by Senior Management as an authorization that these numbers are correct and can be released to NERSA for processing.**
Municipal Manager:	929,944,913	874,907,738	903,668,189	767,317,204	661,912,957 kWh	519,967,035 kWh	63,802	**Sign here and include the date:**
Chief Financial Officer:	929,944,913	874,907,738	903,668,189	767,317,204	661,912,957 kWh	519,967,035 kWh	63,802	**Sign here and include the date:**

Summary			
Revenue from sale of electricity over total revenue derived from electricity distribution %	Cost of energy purchases over total expenditure %	Energy losses %	Repairs and maintenance over revenue from sales of electricity %
94%	85%	21.44%	3%

Electricity Distribution Form

Financial Information
(D1 Form: Balance Sheet)

Completed form to be returned to NERSA no later than:	**31 October 2021**
Financial year reporting on:	**Financial year ending 30 June 2021**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
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D-Forms are available:	
1. On the NERSA website:	www.nersa.org.za
2. In the following formats	Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	Initials	Last Name	Telephone number	Fax number	Email address
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**MR**	**P**	**Murugan**	**0790223746**	**0865062318**	poobalanm@kwadukuza.gov.za

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity. This should ensure that the revenues, costs, assets, liabilities, reserves and provisions are separately identifiable from those of any other business in the books of account of the licensee. The information required is based on the financial accounts for the financial year ending **30 June 2021** and the budget figures for the financial year ending **30 June 2022.**

Please Complete the following:

Capital Employed		Actual 2020/21
Funds & reserves		**0**
Statutory funds	Type here	
Reserves	Type here	
(Accumulated deficit) Retained surplus		**828,980,980**
Trust funds		**0**
Long-term liabilities		**122,979,157**
Consumer deposits		**36,991,209**
Total		**988,951,346**

988,951,346

Employment of Capital - Electricity Distribution Account			Actual 2020/21
Fixed assets			**598,273,899**
Buildings & other fixed assets		**53,266,956**	
Electricity distribution network and equipment		**545,006,943**	
Other (please specify below):			**0**
Type here		Type here	
Type here		Type here	
Type here		Type here	
Investments			Type here
Long-term debtors			Type here
Deferred charges			Type here
Total			**598,273,899**

NET CURRENT ASSETS / LIABILITIES		**390,677,447**

Current Assets		Actual 2020/21
Inventory		**8,142,629**
Debtors (a) + (b)		**113,289,743**
Less than 90 days (a)	**104,892,551**	
90 days or more (b)	**8,397,192**	
Cash		**334,095,735**
Short-term investments		**60,228,952**
Short-term portion of long-term debtors		Type here
Total		**515,757,059**

Current Liabilities	Actual 2020/21
Provisions	**22,047,165**
Creditors: Eskom	**90,726,024**
Creditors: Other	**4,149,971**
Short-term portion of long-term liabilities	**8,156,452**
Bank overdraft	Type here
Total	**125,079,612**

988,951,346

Electricity Distribution Form

Financial Information
(D1 Form: Income Statement)

Completed form to be returned to NERSA no later than:	**31 October 2021**
Financial year reporting on:	**Financial year ending 30 June 2021**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
Completed D-Forms may be returned to one of the following addresses:	Email : **dforms@nersa.org.za**
D-Forms are available: 1. On the NERSA website: 2. In the following formats	www.nersa.org.za Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	Initials	Last Name	Telephone number	Fax number	Email address
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**Mr**	**P**	**Murugan**	**0790223746**	**0865062318**	**poobalanm@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity.

Please complete the following:

	Actual	Budget
Your check list	**2020/21**	**2021/22**
Revenue section	**Completed**	**Completed**
Expenditure section	**Completed**	**Completed**

REVENUE:

	Actual	Budget
Revenue from sale of electricity to the following consumers:	**2020/21**	**2021/22**
Domestic (pre-paid)	132,855,679	152,239,322
Domestic (conventional)	245,534,342	281,357,803
Agriculture	Type here	Type here
Mining & quarrying	Type here	Type here
Manufacturing / Industrial	Type here	Type here
Commercial (pre-paid)	13,903,753	15,932,311
Commercial (conventional)	469,474,663	537,971,016
Transport	Type here	Type here
Redistributors/Resellers	Type here	Type here
Other consumers (please specify below)	0	0
1.	Type here	Type here
2.	Type here	Type here
3.	Type here	Type here
4.	Type here	Type here
Total	861,768,438	987,500,453

	Actual	Budget
Revenue from street lighting & sold to other municipal departments	**2020/21**	**2021/22**
Street lighting	1,758,193	2,014,713
Sold to other municipal departments	11,381,107	13,041,611
Total	13,139,300	15,056,324

	Actual	Budget
Other Income	**2020/21**	**2021/22**
Reconnection fees	1,156,672	850,000
New connections	643,748	800,000
Free Basic Electricity(Equitable share)	7,841,800	4,000,000
Other revenue (Please specify below)	45,394,955	49,008,991
Demand based contributions	10,754,685	16,485,102
Electricity basic charges	19,424,221	19,449,252
Meter tampering fees	2,544,290	1,500,000
Interest on Investments	11,781,370	10,809,637
Sundry Income	890,389	765,000
6.	Type here	Type here
Other Income	55,037,175	54,658,991

Summary Stats (for office use)		
Total Income	**Actual 2020/21**	**Budget 2021/22**
	929,944,913	1,057,215,768
Surplus	**26,276,724**	**760,985**

EXPENSES:

	Actual	Budget
Electricity Purchases from:	**2020/21**	**2021/22**
Eskom	767,317,204	887,793,351
Independent Power Producers Conventional	Type here	Type here
Independent Power Producers Renewable Energy	Type here	Type here
Self Generation	Type here	Type here
Other	Type here	Type here
Total	767,317,204	887,793,351

	Actual	Budget
Repairs, Maintenance and Salaries	**2020/21**	**2021/22**
Repairs and Maintenance:	28,812,873	34,393,889
1. Salaries and allowances	Type here	Type here
2. Materials and supplies	4,251,188	6,149,988
3. Contracted Services	24,561,684	28,243,901
Salaries, wages and allowances including payments to consultants		
1. Salaries, wages and allowances (Excl. Repairs and Maintenance)	48,831,696	56,277,283
2. Payments to consultants (operational work)	Type here	Type here
Total	77,644,569	90,671,172

	Actual	Budget
Financial Costs	**2020/21**	**2021/22**
Interest	13,056,582	17,086,640
Total	13,056,582	17,086,640

	Actual	Budget
Notified Maximum Demand Costs	**2020/21**	**2021/22**
NMD Costs	Type here	Type here
Total	0	0

	Actual	Budget
Other Expenses	**2020/21**	**2021/22**
Bad debts	729,188	2,275,724
FBE paid to Eskom	951,281	1,300,000
Charges from other Municipal Departments	Type here	Type here
General Expenses (please specify below) (Group into 6-main categories)	43,969,365	57,327,896
Depreciation	22,799,051	32,569,543
Collection costs - Contour	6,391,187	7,280,004
Replacement of faulty meters	1,338,378	2,620,800
External audit fees	3,778,471	2,311,783
Insurance Expenses	1,267,263	1,641,049
Other general expenses	8,395,014	10,904,717
Total	45,649,834	60,903,620

	Actual 2020/21	Budget 2021/22
Total Expenditure	903,668,189	1,056,454,783

Electricity Distribution Form

Market Information

(D2 Form: Market)

Completed form to be returned to NERSA no later than:	**31 October 2021**
Financial year reporting on:	**Financial year ending 30 June 2021**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulato dforms@nersa.org.za (012) 401-4600
Completed D-Forms may be returned to one of the following addresses:	Email : **dforms@nersa.org.za**
D-Forms are available:	
1. On the NERSA website:	www.nersa.org.za
2. In the following formats	Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	Initials	Last Name	Telephone number	Fax number	Email address
Example	**Ms**	**L**	**Mkhize**	**012401710**	**012401700**	dforms@nersa.org.za
Contact Person:	**Ms**	**N**	**Singh**	**0844080571**	**0865062318**	**nisharas@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity.

The kWh losses are calculated as follows:

$$\frac{kWh\ Purchased\ and\ Generated - kWh\ Sold}{kWh\ Purchased\ and\ Generated} \times 100\%$$

The average system load factor is calculated as follows:

$$\frac{kWh\ Purchased\ and\ Generated\ in\ the\ Month}{Monthly\ Maximum\ Demand\ in\ kWh \times Number\ of\ hours\ in\ the\ month} \times 100\%$$

The system power factor is calculated as follows:

$$\frac{\text{True Power (P)}}{\text{Apparent Power (S)}}$$

Please complete the following:

	Peak monthly maximum demand		Energy purchased by the licensee		Average Demand Charge				Average Energy Charge	
	Actual 2020/21	Budget 2021/22	Actual 2020/21	Budget 2021/22	Actual 2020/21		Budget 2021/22		Actual 2020/21	Budget 2021/22
Eskom	4,567,929	5,024,722	661,912,957	728,104,253	36	R/kVA/month	39	R/kVA/month	115.92 c/kWh	121.93 c/kWh
Independent Power Producers Conventional	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Independent Power Producers Renewable Energy	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Self Generation	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Other	Type here	Type here	Type here	Type here	Type here	R/kVA/month	Type here	R/kVA/month	c/kWh	c/kWh
Total	4,567,929	5,024,722	661,912,957 kWh	728,104,253 kWh	36	R/kVA/month	39	R/kVA/month	115.9241855 c/kWh	121.9321749 c/kWh

Electricity sold by the licensee to consumers

Consumer classification	Number of consumers			Sales (kWh)				Average Energy Charge (c/kWh)		Licensee check list	
	Actual 2020/21	Budget 2021/22	Estimate 2022/23	Actual 2020/21	Budget 2021/22	Estimate 2022/23		Actual 2020/21	Budget 2021/22	Actual 2020/21	Budget 2021/22
Free Basic Electricity	9,237	10,161	11,177	7,263,352	7,989,687	8,788,656	kWh				
Domestic (pre-paid)	50,411	55,452	60,997	80,198,280	88,218,108	97,039,919	kWh	165.66	172.57		
Domestic (conventional)	10,810	11,891	13,080	127,231,550	139,954,705	153,950,175	kWh	192.98	201.03		
Agriculture	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Mining & quarrying	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Manufacturing / Industrial	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Commercial (pre-paid)	627	690	759	8,199,487	9,019,435	9,921,379	kWh	169.57	176.64		
Commercial (conventional)	1,809	1,990	2,189	300,944,379	331,038,817	364,142,698	kWh	156.00	162.51		
Transport	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Other consumers	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Redistributors/Resellers	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Electricity Department	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Street lighting				Type here	Type here	Type here	kWh				
Sold to other municipal departments	145	160	175	3,393,340	3,732,673	4,105,941	kWh	335.40	349.39		
Total	63,802	70,182	77,200	519,967,035 kWh	571,963,738 kWh	629,160,112	kWh	168.26	175.28		

System factors	Actual 2020/21	Budget 2021/22
Average system load factor	63	70
Average system power factor	Type here	Type here
Energy losses kWh	21.44%	21.44%

Electricity Distribution Form

Human Resources Information
(D3 Form: HR)

Completed form to be returned to NERSA no later than:	**31 October 2021**
Financial year reporting on:	**Financial year ending 30 June 2021**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
Completed D-Forms may be returned to one of the following addresses:	Email : **dforms@nersa.org.za**
D-Forms are available: 1. On the NERSA website: 2. In the following formats	www.nersa.org.za Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	**Initials**	**Last Name**	**Telephone number**	**Fax number**	**Email address**
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**Mr**	**SM**	**Jali**	**0324375087**	**0867338189**	**SibusisoJ@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity. **Only include information of personnel who are working in the Electricity Department e.g. (Electricity Technicians)**.

Please complete the following:

	ACTUAL 2020/21	
Level	**Number of Technical Staff**	**Number of Non-Technical Staff**
Management	**7**	**Type here**
Skilled Labour	**28**	**1**
Unskilled Labour	**33**	**7**
Trainees	**4**	**Type here**
Total staff	72	8
Vacancies	**67**	**3**

Grand total	**150**

Electricity Distribution Form

Tariff Information
(D6 Form: Tariffs)

Completed form to be returned to NERSA no later than:	**31 October 2021**
Financial year reporting on:	**Financial year ending 30 June 2021**
Full name of Licensee	**KWADUKUZA MUNICIPALITY**
Licence number	**NER/D/KZ292**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
Completed D-Forms may be returned to one of the following addresses:	Email : **dforms@nersa.org.za**

D-Forms are available:

1. On the NERSA website:	www.nersa.org.za
2. In the following formats	Excel Documents

	Licensee Contact Person					
	Title (Ms/ Mr)	**Initials**	**Last Name**	**Telephone number**	**Fax number**	**Email address**
Example	**Ms**	**L**	**Mkhize**	**0124014710**	**0124014700**	dforms@nersa.org.za
Contact Person:	**Ms**	**n**	**Singh**	**0844080571**	**0865062318**	**nisharas@kwadukuza.gov.za**

All information requested relates to a RING-FENCED ELECTRICITY DISTRIBUTION ACTIVITY. RING-FENCED means that separate accounts are kept for the electricity distribution activity.

Please complete the following:

		Click on a cell for code									
Tariff Name	**Tariff Number**	**SIC** (code)	**Load profile** (code)	**Tariff structure** (code)	**Number of consumers**	**Energy Sales**	**Revenue derived from energy charges**	**Revenue derived from demand charges**	**Revenue derived from fixed charge**	**Revenue**	**Extra municipal surcharge**
Industrial Low Voltage	1	0	1	5.1	807	78,872,791 kWh	169,424,998	Type here	Type here	169,424,998	Type here %
Domestic/ Sectional titles	2	0	2	5.1	216	23,816,971.40 kWh	46,781,694	Type here	Type here	46,781,694	Type here %
Commercial conventional	3	6	4	5.1	1,033	18,371,815 kWh	38,417,068	Type here	Type here	38,417,068	Type here %
Domestic customers conv	4 (1a)	0	1	5.1	10,357	102,554,126 kWh	197,441,287	Type here	Type here	197,441,287	Type here %
Domestic Conventional In	4 (1b)	0	1	5.1	237	860,452 kWh	1,311,361	Type here	Type here	1,311,361	Type here %
Domestic Religious org	5	0	1	5.1	51	410,468 kWh	900,700	Type here	Type here	900,700	Type here %
Street lighting	6	4	1	5.1	23	751,553 kWh	1,758,193	Type here	Type here	1,758,193	Type here %
Industrial >1000 kva - Sap	7 (aa)	6	5	5.1	1	126,548,419 kWh	151,371,583	Type here	Type here	151,371,583	Type here %
Prepaid domestic indigent	8 (i)	0	1	5.1	9,000	6,402,900 kWh	7,721,897	Type here	Type here	7,721,897	Type here %
Prepaid domestic low	8 (iii)	0	1	5.1	41,411	73,795,380 kWh	125,133,781	Type here	Type here	125,133,781	Type here %
Prepaid Commercial	8 (iv)	6	4	5.1	627	8,199,487 kWh	13,903,753	Type here	Type here	13,903,753	Type here %
Non STD Industrial	9	6	6	5.1	35	79,054,534 kWh	120,086,664	Type here	Type here	120,086,664	Type here %
Industrial, Commercial & (	10	6	5	5.1	4	328,138 kWh	654,758	Type here	Type here	654,758	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Type here	Type here	Type here	Type here	Type here	Type here	Type here kWh	Type here	Type here	Type here	0	Type here %
Total					**63,802**	**519,967,035** kWh	**874,907,738**	**0**	**0**	**874,907,738**	

ANNEXURE D – D3: STRATEGY REPORT

DELIVERABLE 3:

STRATEGY DOCUMENT – KWADUKUZA LOCAL MUNICIPALITY (KDM)

Project Title: Development of Non-Revenue Electricity Management Strategies and Programmes for KwaDukuza & Mandeni Municipalities

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Contract No.: VILP/I/033

Date: 26/08/2022

Version 2

Prepared By:

Leon Prinsloo	
Prasun Seebran	
Martin Piper	

Contents

Acronyms and Abbreviations

ABBREVIATION	DESCRIPTION
AMIS	Asset Management Information System
AMR	Automatic Meter Reading
BI	Business Intelligence
CRM	Customer Relationship Management
CT	Current Transformer
DBSA	Development Bank of Southern Africa
DMRE	Department of Minerals & Energy
DWH	Data Warehousing
EMP	Electricity Master Plan
FY	Financial Year
FAR	Fixed Asset Register
GIS	Geographic Information System
GPS	Global Positioning System
HEU	High End User
HUC	High Use Customers
HV	High Voltage
ICT	Information and Communication Technology
IDM	iLembe District Municipality
IDP	Integrated Development Plan
IT	Information Technology
KDM	KwaDukuza Local Municipality
kVA	Kilo Volt-Ampere
kWh	kilowatt-hour
LPU	Large Power User
LV	Low Voltage
MMS	Meter Management System
MLM	Mandeni Local Municipality
MIS	Management Information System
MRC	Meter Reading Contractor
mSCOA	Municipal Standard Chart of Accounts
MTSF	Medium Term Strategic Framework
MV	Medium Voltage
MW	Mega Watts

NT	National Treasury
NTL	Non-Technical Losses
NRE	Non-revenue electricity
NRS	National Regulatory Services
PCU	Vuthela Programme Coordinating Unit
PFM	Public Finance Management
PILC	Paper insulated lead covered
POD	Point of Delivery
POS	Point of Supply
PSP	Professional Service Provider
RMSP	Remote Meter Service Provider
SCADA	Supervisory Control and Data Acquisition
SDF	Spatial Development Framework
SLD	Single Line Diagram
SPU	Small Power User
STS	Standard Transfer Specification
TAR	Technical Asset Register
TID	Token Identifier
TL	Technical Losses
ToR	Terms of Reference
TOU	Time of Use
VT	Voltage Transformer
WBG	World Bank Group

1 EXECUTIVE OVERVIEW

This document is the third deliverable of the Vuthela iLembe LED Programme's Development of Non-Revenue Electricity Management Strategies and Programmes for the KwaDukuza and Mandeni Local Municipalities. The deliverables are listed below:

- Deliverable one: Inception report
- Deliverable two: Status Quo report
- Deliverable three: Strategy report.

This deliverable requires two Strategy documents to be provided, one each for KwaDukuza and Mandeni Local Municipalities.

This Strategy Document is for the KwaDukuza Local Municipality (KDM).

The report entails the formulation of Specific Technical, Financial, Institutional, and Social Interventions and Initiatives (Projects / Systems) into Strategies to:

- Curtail energy losses
- Reduce non-revenue electricity
- And improve performance of the electricity service in the municipality.

The document is structured as follows:

- Terms of Reference (ToR) for this deliverable
- Summary of findings of Status Quo Report
- Existing Strategy document(s) / Other Strategy Reference Documents
- Technical Strategies (for reduction of real losses)
- Financial Strategies (for addressing and reducing commercial losses)
- Institutional Interventions
- Social Interventions & Initiatives

2 TERMS OF REFERENCE

The ToR for this deliverable – Strategies Development reads as follows:

"…the consultant will be expected to provide a clear indication of the:

I. Prioritization of the interventions and initiatives within the context of a sustainable programme to reduce the electricity losses and curb non-revenue electricity - after due consideration of potential impact, identification of "quick wins", availability of funding, and the technical capacity of each municipality. The consultant will be expected to recommend the most viable intervention, based on highest likely impact towards reduction of NRE in the respective municipalities. This intervention will be developed into a pilot project that will be implemented as part of the Vuthela programme.

II. Provide a basic, high-level scope of work for each specific intervention and initiative, roles, and responsibilities within each municipality regarding technical, financial, social, institutional, and social work components.

III. Estimate of required resources (human, skills, financial, etc.) for the implementation of each strategy or initiative to reduce the electricity losses and curb non-revenue electricity.

IV. Funding options available to each municipality for the implementation of the specific interventions or initiatives in the strategies for reduction of the non-revenue electricity.

V. Provisional SMART (Specific, Measurable, Achievable, Realistic, Timely) implementation schedules (short-, medium- and long-term timelines) for the specific interventions or initiatives, taking into consideration municipal resources (technical, financial, human); this will form the basis of the programme component of the assignment.

VI. Risks and risk mitigation measures regarding the implementation of the identified interventions or initiatives included in the strategies.

VII. Innovative procurement and implementation options for the effective and efficient delivery of the specific interventions or initiatives.

VIII. Recommendations for the sustainability, institutionalization, and mainstreaming of the specific interventions and initiatives as an on-going programme within the municipality vis-à-vis the required technical, financial, and institutional resources.

The overall project aims to propose interventions presented in the strategies to reduce revenue losses. The KDM and MLM can then introduce mechanisms for implementation through their procurement system. Consultation and communication with all stakeholders involved in the provision of electricity in the two municipalities is anticipated.

The PSC will ensure that these channels of communication are kept open, and the service provider will be expected to present the proposed strategies to the project steering committee.

Thereafter, the report, detailing at the proposed strategies documents with the proposed interventions will be submitted in draft form for comment and finalisation.

3 STATUS QUO REPORT – FINDINGS SUMMARY

The Status Quo report was the second deliverable on the project. It consisted of the compilation of a comprehensive report of the current situation of several aspects, grouped under four main categories:

- Key Network Installations
- Technical Losses
- Non-Technical Losses
- Community / End-user campaigns & Communication.

The final Status Quo report was submitted on 29 June 2022.

Below follows a summary of the aspects assessed and related findings.

3.1 Existing Infrastructure Assessment

3.1.1 Key Network Installations

- No regular revision of single line diagrams and GIS data sets
- Need for development of additional data sets for:
    - Spatial layer for LV kiosks
    - Spatial layer for electricity meters (prepaid & conventional)
    - Spatial layer for customer network link

3.1.2 General Infrastructure Assessment

- Aged infrastructure with need for ongoing preventative maintenance
- Refurbishment needs at some substations
- Need for replacement of some aged switchgear as well as oil switchgear
- Need for refurbishment of certain aged switching substations
- Oil type switchgear requiring replacement
- Ongoing KDM MV upgrade projects in place

3.1.3 General Assessment of Metering & Meter Reading for Bulk purchases

- All electricity is purchased from Eskom as the sole service provider for electricity in the country.
- Shakaskraal intake point only one with an additional monthly service charge.
- No check meters to verify accuracy of Eskom billing
- Total losses have grown from 16.4% in 2016 to 21.4% in FY 2021 and showing a constant climbing trend.

3.1.4 General Assessment of Metering & Meter Reading for Large Power Users

- 493 LPU customers using an average of 15 372 kWh per month per customer.
- 55 Customers are billed estimates.
- Not all LPU customers on functioning AMR. Only about 137 functioning on AMR. The rest have issues such as communication challenges or meter stolen / tamper issues
- No data verification process / system in place to verify AMR data accuracy before importing into financial system.
- Data inaccuracies in the AMR data and / or financial system, indicating a data deep dive analysis and clean-up to ensure data in the AMR system and the financial system mirrors each other.

3.1.5 Roles & Responsibilities

- KDM is the licensed provider, for its service areas. The electricity department falls within the Electricity Business Unit that is responsible for,
    - Planning, design and installation of electrical infrastructure
    - Approval of all service connections to KDM network assets
    - Comments/Recommendations for approval of SPLUMA and other applications.
    - Purchasing of electricity from Eskom and metering at their consumers.
    - Maintenance of municipality fleet of vehicles, plant and machinery.
- Electricity provision
    - Need for filling vacant positions. Artisans for example
    - Current shortage of staff to conduct preventative maintenance
    - Key branches in the structure identified for development:

- Network Control & Support
- Protection Telecontrol & Metering
- Projects & Assets

- Billing & Revenue
  - Several vacancies in meter reading section as well as credit control, position of credit control manager also indicated as vacant but has been filled.

3.1.6 Policies, Tariff Setting, Asset Management Planning, and Budgets for Maintenance

- Bylaws & policies
  - Greater extent of required bylaws & policies is in place, this needs to be reviewed periodically to ensure the bylaws meet current needs.
- Tariff setting
  - Methodology for tariff setting not documented in detail. The current approach is to incrementally increase tariffs on a yearly basis based on a fixed percentage based on NERSA approved increases.
  - Possible disparity between bulk cost of electricity and set tariffs.
  - Need for tariff study and review.
- Asset Management & Planning
  - Relatively low asset management practice maturity
  - IMQS Asset Management Plan (AMP) is high level AMP with aim to steer KDM towards quality asset management planning
  - Need to move from 80% corrective & 20% preventative maintenance to 20% corrective and 80% preventative maintenance.
- Budgets for Operations & Maintenance
  - Budgets of approximately R 30 million per financial year in 2022/23, 2023/24 and 2024/25. Value approximately 3% of total budgeted costs.

3.1.7 Technical Management Information Systems

- Systems identified:
  - ESRI ArcGIS for spatial planning & development
  - Munsoft for financial management & billing

- Contour Technology prepaid vending system.
- Pinnaculum AMR system for AMR metering of 137 LPU customers.
- Sage VIP Premier for payroll
- Microsoft: Excel, Projects, Teams etc
- On Key as maintenance management system for electrical assets
  - Not utilized fully
- SCADA:
  - No current functionality in KDM. Process under way to implement at substation level
- Asset Management Information System (AMIS)
  - Solution roadmap presented in separate study, but recommendations not yet implemented.

3.2 Technical losses

- Two studies in recent years:
  - 2019 Master Plan revision
    - Estimated technical losses for Northern & Southern region were at 6% and 8% respectively
  - World Bank study 2021
    - Focused on MV network. LV excluded.
    - 4.92% worst case scenario loss.
    - 4.5% more realistic.

Conclusion that technical losses can be viewed at around 8.5% and used as benchmark for the purpose of current analysis. It is however recommended that detailed analysis is carried out to identify the actual percentage and will form part of the proposed strategies.

3.3 Non-technical losses

3.3.1 Assess completeness & adequacy of metering of electricity - various categories of users

Tariff descriptions used that seemingly does not link back to a tariff structure

- Errors between type of account and tariff type. Commercial and domestic account types for example linked to streetlight tariffs.
- A large number of stands (29681) have no tariff, nor account type description.
- Large need identified for data cleansing

3.3.2 Assess adequacy, efficiency of institutional arrangements for meter installations & readings

- Some SOPs exist, but not for all processes.
- Room for improvement noted for process flow type SOP with “swim lanes” and linked to possible SLA between departments.

3.3.3 Assess adequacy, effectiveness & efficiency of financial systems

- Main financial system (Munsoft) is mSCOA compliant
- Supplementary prepaid system (Contour Technology) STS (Standard Transfer Specification) compliant.
- Supplementary AMR (Automated Meter Reading) system in place.
- No automatic interfacing between systems
- No supporting Data Management system for data verification and mining purposes.

3.3.4 Assess integrity, completeness & accuracy of energy customer data base

- A Vuthela Data cleansing project was undertaken by RUMAS (Revenue & Utility Management Services) and concluded in 2021. Although current ongoing data cleansing efforts were mentioned, no detail was provided.
- Cadastral data indicates 34 438 registered stands.
- Some duplication of 6 stands in cadastral data to be investigated.
- Valuation roll and customer data base have considerably more stands in its records.
- Some stands have incorrect length SG code – should be 21 digits
- Some stands have the same SG code.
- 4409 stands have multiple prepaid meters linked to it.

Anomalies in valuation roll and comparative data from valuation roll and customer data base suggest a further data cleansing exercise.

KDM to also consider a different strategy on multiple meters linked to a specific stand.

3.3.5 Review report on Customer Relations Management System and / or Information Systems

- Reports done in 2020 reviewed in this regard:

- Vuthela CRM technical feasibility report dated 30 June 2020.
- Strategic plan for the iLembe Regional Customer Care centre dated 19 June 2020
- Reports recommend a single platform Customer Care system for whole of iLembe. Our views support this recommendation.

3.3.6 Assess billing & revenue collection re electrical services provision

- Conventional meters
    - Approximately 37% of customers are billed estimates
- Prepaid customers
    - 42% of customers have not purchased electricity in 12 months

3.3.7 Investigate necessity of tariff study and review

A service provider was recently appointed to undertake a tariff study and review. New tariffs are currently being developed along with the cost of supply.

The next step will be process of obtaining approval from NERSA.

3.3.8 Review completed Indigent register study

- A report done in April 2020 titled “Alignment of Indigent policies, Uniform systems and processes for maintaining the indigent register across municipalities” indicated the following:
    - Existing systems & processes has “gaps”
    - Establishment of a centralised repository with following features was recommended:
        - Web and cloud based.
        - Secure
        - Audit trail functionality

3.3.9 Review of Debt management

- Large debtor’s book of approximately R 310m
- 38% older than 365 days
- 55% older than 90 days

- Domestic consumers biggest contributing category
- Data gaps with 68% not linked to any customer type.
- Indicates serious challenges in debtor book management

3.4 Community / End-user Awareness Communication & Campaigns

Community awareness currently on a small scale as part of the IDP roadshows in the form of a one slide presentation within the overall IDP roadshow presentation.

Need identified for much bigger scale ongoing community engagement and awareness intervention on matters such as responsibility to pay for services and the dangers / consequences of electricity tampering / theft.

4 EXISTING STRATEGY DOCUMENT(S) / OTHER REFERENCE DOCUMENTS

In the preparation of this strategy document, the information contained on the PDF document titled “KDM_Strategies to Tackle Energy Losses” dated 2022/06/02 has been used as a guide to ensure alignment with strategies already planned or implemented.

Certain strategies will therefore be an affirmation of strategies contained in this document, and others will be supplementary to the document, with the aim of further strengthening the existing strategy.

In addition, the PDF document titled “Report 2_LRP Project_Final”, being a strategy document on clamping down on energy losses on Mozambique and compiled by Mr Andres Detomasi in May 2020, was also used as possible guidance in recommending appropriate strategies for KDM.

5 STRATEGIES

5.1 Introduction

The strategies presented in this section of the document, are not aimed at addressing all the gaps identified during the status quo process. We aim to provide strategies that will have the highest impact, especially strategies that can target “low hanging” fruit.

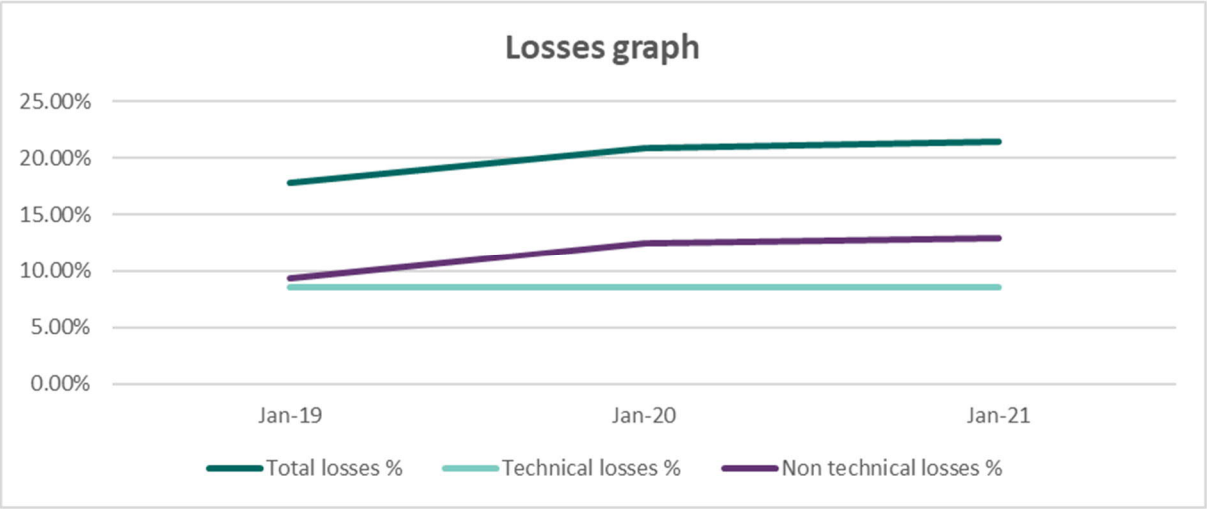
We believe the strategies presented here, will have the optimum impact to set the municipality on a path of optimum income from service charges (in this case electricity), which will then allow for funding to be made available for further initiatives to address remaining gaps and / or next level processes / systems to optimize revenue even further from electricity service charges and reduce losses to a world class level (11% as per NERSA).

The strategies are also built on the point of view that not much can be done in the short term to reduce technical losses until additional analysis is conducted on the current networks, and that the biggest impact will be on focusing on strategies that will improve non-technical losses. With technical losses currently benchmarked at 8.5% for this analysis, it implies that non-technical losses need to reduce to around 3%, where the latest figure places it at 12.94%. See below table and graph from the Status Quo report based on NERSA D forms information.

NERSA D FORMS SUMMARY	FINANCIAL YEAR ENDING		
	Jul-19	Jul-20	Jul-21
Energy Purchased in kWh	674,809,144	655,647,276	661,912,957

Energy Sold in kWh	Units	% of Energy bought	Units	% of Energy bought	Units	% of Energy bought
Free basic electricity	8,296,542	1.25%	7,203,742	1.09%	7,623,352	1.15%
Domestic (prepaid)	78,301,215	11.83%	77,923,591	11.77%	80,198,280	12.12%
Domestic (conventional)	124,323,584	18.78%	119,444,205	18.05%	127,231,550	19.22%
Commerial (prepaid)	17,729,029	2.68%	7,912,835	1.20%	8,199,487	1.24%
Commerial (conventional)	333,417,335	50.37%	311,321,719	47.03%	300,944,379	45.47%
Sales to other municipalities	982,001	0.15%	1,747,758	0.26%	3,393,340	0.51%
Total Sales	**554,753,164**	**83.81%**	**518,350,108**	**78.31%**	**519,967,036**	**78.56%**

Total losses in kWh	120,055,980	137,297,168	141,945,921
Total losses %	17.79%	20.94%	21.44%
Technical losses %	8.50%	8.50%	8.50%
Non technical losses %	**9.29%**	**12.44%**	**12.94%**



Successfully implemented strategies will off course have significant impact on potential additional revenue, based on the average annual selling price per unit of electricity. Below table provides and overview of the potential revenue this could have had in the past three financial year if losses were within the benchmark 11%. As previously mentioned, it implies non-technical losses need to reduce to around 3% to achieve this.

NERSA benchmark 11 % total losses		74,229,006		72,121,200		72,810,425
Additional sales		45,826,974		65,175,968		69,135,496
Annual average selling price per unit	R	1.4225	R	1.6279	R	1.6826
Potential additional revenue at benchmark losses	**R**	**65,188,870.74**	**R**	**106,099,957.72**	**R**	**116,327,385.12**

We are also mindful of what we perceive as a general vision to unify systems and processes within iLembe and its member local municipalities and aim to use as a basis for recommended strategies.

5.2 Strategies Overview

This strategy document contains a total of 16 strategies, broken down into:

- 5 x Technical Strategies
- 4 x Financial Strategies
- 6 x Institutional Strategies
- 1 x Social Intervention Strategy

The table below provides a high-level overview of the strategies.

Strategy nr	Description
T1	Eskom POS Metering assurance
T2	Ensure all LPU Customers on AMR
T3	Technical & Non-technical losses separation
T4	Implementation of SCADA System & Control Centre Phases 1-3
T5	Electrification & prepaid metering of informal settlements
F1	LPU customer audits & consumption verification
F2	Bulk metering of stands with multiple prepaid meters
F3	SPU customer metering / vending assurance
F4	Review of credit control processes & activities
I1	Intra- & Interdepartmental Standard Operating Procedures enhancement
I2	Tariff study & review
I3	Implementation of KDM CRM system
I4	Implementation of single platform iLembe Indigent Management System
I5	Implementation of Data Warehousing & Business Intelligence (BI) platforms
I6	Establishment of Revenue Protection Unit
S1	Community Engagement

5.3 Technical Strategies

5.3.1 Strategy T1 – Eskom POS Metering Assurance

5.3.1.1 Strategy Description

Installation of 6 check meters on the 3 Eskom intake points, with the aim of validating Eskom readings, as opposed to sole reliance on Eskom information.

This is an **existing strategy** of KDM with a partially completed status.

- Shakaskraal - completed.
- Stanger – Work in Progress
- Driefontein – Due to potential vandalism at the Driefontein intake point, the check meter will be installed at Ballito & Zimbali substations.

KDM aims to have all check meters installed by the first quarter of the 2022/23 financial year.

5.3.1.2 Strategy Matrix

In line with the ToR, a strategy Matrix is used to indicate the strategy's level of priority from the following requirements: (We indicate our understanding of each priority)

- Impact – Measurement of % reduction in losses - **L**ow (0-1%), **M**edium (1-2%), **H**igh (> 2%)
- Quick win – Ability of the strategy to provide significant impact on loss reduction over a short-term period (12 months) – **H**igh impact or **L**ow impact
- Funding Availability – Has funding been **B**udgeted for, or should funding be **S**ourced?
- Technical Capacity – Does the municipality have the capacity available **I**n-house, or should **O**utsourcing be considered

The Priority matrix for this strategy is indicated below

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
T1	Eskom POS Metering assurance	Technical	L	L	B	O

5.3.1.3 High level scope

The high-level scope for the remainder of this strategy is highlighted below.

Nr	T1 Eskom POS Metering assurance	
	Scope	Roles & Responsibilities
1	**Stanger POS** Verify functionality of metering cable from Eskom CT's & VT's Install 2x check meters Install 3x VT, 6x CT's and associated support structures & conductors Download metering data on monthly basis & compare with Eskom billing data	Outsourced to service provider
	Ballito Substation Install 3x VTS's & 3x CT's & supporting overhead equipment Install check meter Download metering data on monthly basis & compare with Eskom billing data	Outsourced to service provider
2	**Zimbali Substation** Install 3x VTS's & 3x CT's & supporting overhead equipment Install check meter Download metering data on monthly basis & compare with Eskom billing data	Outsourced to service provider

5.3.1.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- Typical CT/VT requirements based on number of incoming feeders at the supply point.
- Equipment cost are typical based on current pricing for key equipment, CT, VT and meter.
- The installation costs are based on similar installations done at substations within KDM
- Typical design cost included at 13% of CAPEX.

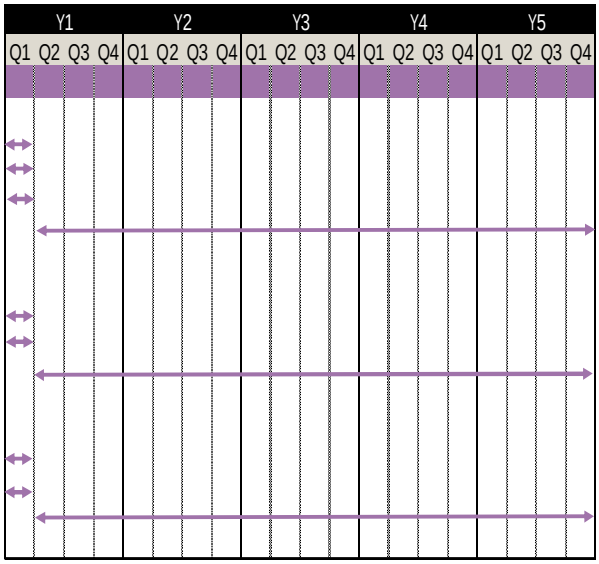
The table below provides an overview of the associated costs estimate for this strategy.

T1 Eskom POS Metering assurance									R 1,311,000
				Commitment					
Contractor / Consultant Costs	Number	Cost/Item		Y1	Y2	Y3	Y4	Y5	Total cost
CT Installation & Commissioning	12	R	6,000	1	0	0	0	0	R 72,000
VT Installation & Commissioning	9	R	6,000	1	0	0	0	0	R 54,000
Check Meter Installation & Commissioning	4	R	4,500	1	0	0	0	0	R 18,000
Supporting Structures & Conductors Installation	1	R	30,000	1	0	0	0	0	R 30,000
Design Costs	1	R	150,000	1					R 150,000
TOTAL Contractor Costs									R 324,000

Equipment & Materials	Number	Cost/Item		Y1	Y2	Y3	Y4	Y5	Total cost
CT	12	R	35,000	12					R 420,000
VT	9	R	27,000	9					R 243,000
Check meter & panels	4	R	55,000	4					R 220,000
Supporting structures & conductors	1	R	104,000	1					R 104,000
TOTAL Equipment & Materials									R 987,000

5.3.1.5 SMART implementation schedules

T1 Eskom POS Metering assurance
Stanger POS Verify functionality of metering cable from Eskom CT's & VT's Install 2x check meters Install 3x VT, 6x CT's and associated support structures & conductors Download metering data on monthly basis & compare with Eskom billing data
Ballito Substation Install 3x VTS's & 3x CT's & supporting overhead equipment Install check meter Download metering data on monthly basis & compare with Eskom billing data
Zimbali Substation Install 3x VTS's & 3x CT's & supporting overhead equipment Install check meter Download metering data on monthly basis & compare with Eskom billing data



5.3.1.6 Risks & Mitigation measures

Nr	T1 Eskom POS Metering assurance		
	Risk	Impact	Mitigation
1	Commercially non-compliant service provider / under performing service provider	Scheduling delays / poor quality workmanship	Ensure stict management of contract against deliverables and address through remedial measures in contract, including if need be, termination of contract.
2	Lack of internal resources to compare check meter info against Eskom data on monthly basis, querying anomalies with Eskom and ensuring corrective measures take place	Fruitless & wastefull expenditure of check metering installations	Ensure appointment of skilled person within planned revenue protection unit. Manage performance against agreed KPI's

5.3.1.7 Procurement & Implementation options

Procurement & implementation is outsourced for this strategy.

5.3.2 Strategy T2 – Ensure all LPU Customers on Automated Meter Reading

5.3.2.1 Strategy Description

The **existing** KDM Energy losses strategy document list errors on metering of the 493 LPU customers as having the biggest impact on losses.

The KDM strategy is to:

- List the 493 customers (our analysis showed 489 customers as some accounts had more than one meter active against it)
- Download Munsoft billing data for 5 years
- Analyse the billing data & compare tariff profiles to Eskom meter downloads.
- Perform physical meter audits.

Our recommendation is a slight deviation from this approach, but with the same end goal in mind.

It is recommended that all LPU customers be moved to functioning Automated Meter reading. Out of all the LPU customers, approximately 137 are on functioning AMR, while another 303 have AMR meters, but are not functioning as AMR due to challenges such communication issues and meters stolen / tampered.

This implies that 303 customers need to get functioning AMR and another 53 require an AMR installation.

Moving all LPU customers to functioning AMR is a necessary step towards metering assurance and data analysis of LPU customers for the purpose of identifying gaps in consumption, compiling back billing reports and back billing customers for the correct consumption.

Financial strategy F1 - LPU customer audits & billing verification will be dependent on this strategy for successful implementation.

5.3.2.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
T2	Ensure all LPU Customers on AMR	Technical	L	L	S	O

Notes: This strategy on its own will not have a significant impact on losses, but is regarded as a necessary step towards enabling the financial strategy where impact is considered to be high as well as a quick win

5.3.2.3 High level scope

Nr	T2 Ensure all LPU Customers on AMR	
	Scope	Roles & Responsibilities
1	Ensure 303 AMR customers have functioning AMR. Replace 53 additional LPU customer's meters with AMR meters	Outsourced to service provider
2	Ensure quality of information uploaded to Munsoft system, including correct meter number, correct install date, correct CT and VT ratios and correct tariff structure.	1- Service provider to provide correct installation data to Electrical department 2- Electrical department to ensure quality insurance on installation and provide Finance department with quality assured data 3- Finance department to ensure uploading of meter info to correct account and correct closing off of old meter.
3	Ensure information in Munsoft system and information in AMR system are mirrored	Finance department

5.3.2.4 Cost Estimation

For the purpose of cost estimations, the following assumptions has been made:

- 53 new AMR installations over the next six months.
- 303 AMR installations to be audited and repaired over the next six months.
- Contractor cost per AMR installation / repair = R 2000
- Cost of AMR meter = R 2500.
- Cost of communication modem = R 1500

Table below provides and overview of the associate costs against assumed rates over the strategy period.

T2 Ensure all LPU Customers on AMR									R	3,540,750
			Annual Quantity							
Contractor Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost		
AMR Installation, commisioning & removal of old meter	53	R 2,000	53					R	106,000	
AMR audits & repairs of 303 meters	303	R 2,000	303					R	606,000	
Web hosting of reading data	493	R 150	493	493	493	493	493	R	369,750	
								R	-	
TOTAL Contractor Costs								R	1,081,750	

			Annual Quantity						
Equipment & Materials	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost	
AMR meter	53	R 2,500	53	144	80			R	692,500
Modem	356	R 1,500	356					R	534,000
Data Communication per month	493	R 500	493	493	493	493	493	R	1,232,500
TOTAL Equipment & Materials								R	2,459,000

5.3.2.5 SMART implementation schedules

	Y1				Y2				Y3				Y4				Y5			
T2 Ensure all LPU Customers on AMR	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Ensure 303 AMR customers have functioning AMR. Replace 53 additional LPU customer's meters with AMR meters																				
Ensure quality of information uploaded to Munsoft system, including correct meter number, correct install date, correct CT and VT ratios and correct tariff structure.																				
Ensure information in Munsoft system and information in AMR system are mirrored																				

5.3.2.6 Risks & Mitigation measures

Nr	T2 Ensure all LPU Customers on AMR		
	Risk	Impact	Mitigation
1	Commercially non-compliant service provider / under performing service provider	Scheduling delays / poor quality workmanship	Ensure stict management of contract against deliverables and address through remedial measures in contract, including if need be, termination of contract.
2	Poor quality data entering Munsoft system	Billing errors to customer due to incorrect tariff etc	Ensure mirroring of information in Munsoft system and AMR system
3	Non-implementation of financial follow up strategy	Reduced high impact on losses and low quick gains	Ensure imlementation of financial follow up strategy

5.3.2.7 Procurement & Implementation options

Replacement of non-AMR meters with AMR meters are recommended to be outsourced to a qualifying service provider.

Funding to be sourced from CAPEX or OPEX budgets under maintenance and repairs.

5.3.3 Strategy T3 – Technical & Non-technical losses separation

5.3.3.1 Strategy Description

In order to be able to report on losses, there must be an understanding of the components of losses, and each should be clearly defined. Losses should be classified between technical and non-technical losses with technical losses being electrical losses on the network and non-technical losses being energy consumed but not billed.

There is currently no business process within KDM to determine technical losses, no network models and insufficient metering available to do load flow studies to calculate demand losses. Only overall losses are calculated based on energy balance and 10% of this loss is attributed to technical losses with the remaining losses attributed to non-technical losses.

The proposed strategy for technical losses is to establish a calculation methodology and review of technical losses on an annual basis. An initial cost for consulting services for the definition of the methodology and the modelling of the KDM networks will be incurred. The annual study can be carried out by external consultants which implies an annual expense for the consulting service without further technical or administrative skills needed within KDM. The yearly study will provide an updated figure of the TL level that directly affects the value of NTL. KDM have identified a need to procure simulation software as part of their technical loss strategies and this will be included within the scope. The modelling does not explicitly include all LV networks however sample networks representative of the KDM system must be included in the study and the results extrapolated to obtain a TL figure in the LV system that is not the result of generic rules but is supported by the modelling of the network.

The proposed strategy for non-technical losses is to use statistics from KDM to enable the breakdown of non-technical losses and classification into the main components being,

- Illegal connections
- Meter tamper (fraud)
- Faulty meters and metering errors
- Errors in estimations (unmetered demands, interims, etc.)
- Errors in commercial systems

The statistics required from the main components identified above will be derived from other similar strategies that are covered independently in other strategies and will not be included within the scope of this strategy. The losses separation methodology and annual losses separation will however be included.

5.3.3.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
T3	Technical & Non-technical losses seperation	Technical	L	L	B	I/O

This strategy on its own will not have a significant impact on losses but is an enabler project that will provide more detail on the different loss contributors and quantify loss contribution from the different categories.

5.3.3.3 High level scope

Nr	T3 Technical & Non-technical losses seperation	
	Scope	Roles & Responsibilities
1	Update SLD of KDM network at HV/MV and MV/LV distribution level	Outsourced to service provider with support from KDM electricity department
2	Procure electrical simulation software	KDM electricty department
3	Build KDM simulation model and establish technical loss methodology and calculation for both demand and energy losses based on the maximum demand, load profiles and load factors – Base. Utilise metering data via control after SCADA phase 1/2/3 projects are implemented and use this to calibrate model. In the interim metering data can be captured directly into spreadsheets custom designed for this purpose at substation and switching substation level.	Outsourced to service provider/KDM electricty department
4	Run network optimisation study to improve network performance, the output of this study will guide the network reconfiguration and strengthening that will support the reduction of technical losses.	Outsourced to service provider
5	Annual Technical Loss & Optimisation Study Update	Outsourced to service provider
6	Develop losses separation methodology	Outsourced to service provider
7	Annual Losses Separation	Outsourced to service provider with support from KDM electricity/finance department

5.3.3.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

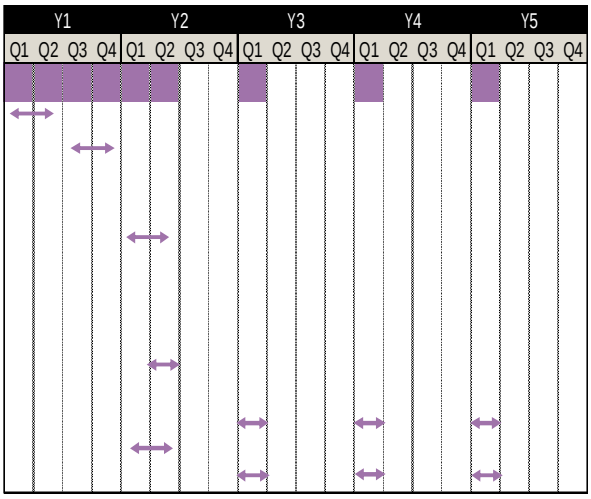
- Consultant hours to update the existing SLD's, R750 per hour at 320 hours
- Consultant hours to build MV model, LV sample networks, calibrate model using metering data and run base TL study, R750 per hour at 600 hours
- Consultant hours to run network optimisation study, R750 per hour at 80 hours
- Consultant hours to run Annual TL & optimisation study, R750 per hour at 300 hours
- Consultant hours to develop losses separation methodology, R750 per hour at 400 hours
- Software cost is based on typical simulation software used by similar utilities with base package, time overcurrent protection and distribution network tools for two users. This pricing also includes yearly maintenance cost of R18000 a year.

T3 Technical & Non-technical losses separation										
				Annual Quantity						
Contractor/Consultants	Number		Cost/Item	Y1	Y2	Y3	Y4	Y5		Total cost
Update Single Line Diagrams	1	R	240,000	1					R	240,000
Build Electrical Model & run TL study	1	R	450,000	1					R	450,000
Run Optimisation Study	1	R	60,000	1					R	60,000
Annual TL & Optimisation Study	4	R	225,000		1	1	1	1	R	900,000
Develop losses seperation methodology	1	R	300,000	1					R	300,000
Annual lossess seperation	4	R	100,000	1	1	1	1	1	R	500,000
TOTAL Contractor/Consultants									R	2,450,000

Simulation Software										
				Annual Quantity						
	Number		Cost/Item	Y1	Y2	Y3	Y4	Y5		Total cost
Procure Software incl. training	1	R	534,000	1					R	534,000
Yearly Maintenance	5	R	78,000	1	1	1	1	1	R	390,000
TOTAL Equipment									R	924,000

5.3.3.5 SMART implementation schedules

T3 Technical & Non-technical losses seperation
Update SLD of KDM network at MV distribution level 33/11kV
Procure electrical simulation software
Build KDM simulation model and establish technical loss methodology and calculation for both demand and energy losses based on the maximum demand, load profiles and load factors – Base. Utilise metering data via control after SCADA phase 1/2/3 projects are implemented and use this to calibrate model. In the interim metering data can be captured directly into spreadsheets custom designed for this purpose at substation and switching substation level.
Run network optimisation study to improve network performance, the output of this study will guide the network reconfiguration and strengthening that will support the reduction of technical losses.
Annual Technical Loss & Optimisation Study Update
Develop losses separation methodology
Annual Losses Separation



5.3.3.6 Risks & Mitigation measures

Nr	T3 Technical & Non-technical losses separation		
	Risk	Impact	Mitigation
1	Lack of internal capacity and training to utilise electrical simulation software	Sotware will not be fully utilised and service provider assessments cannot be reviewed adequately	Proposed Electrical department organogram for 2023-2024 needs to be implemented. Applicable staff trained and maintenance package for software available that offers support.
2	Lack of metering data to conduct TL study	This can result in inaccurate TL estimates	Ensure SCADA project provides the required substation and switching substations statistical metering data back to control that is usable. In the interim capture data periodically at these points and log in spreadsheet environment.
3	Lack of internal capacity and training to capture required statistics to categorise NTL components based on losses seperation methodology	Challenge in identifying source of losses resulting in limited success of revenue recovery	Training of staff / Possible outsourcing of servcie to experienced consultants in the beginning with aim of eventually transferring skills to KDM staff

5.3.3.7 Procurement & Implementation options

The procurement of the electrical simulation software will be budgeted for by KDM which should include training which will be outsourced to a service provider.

The methodologies and studies can be initially developed and carried out by consultants which implies an initial and annual expense without further technical or administrative skills needed within the KDM. Budgeting for these services will be required by KDM.

5.3.4 Strategy T4 – Implementation of SCADA system & Control Centre

5.3.4.1 Strategy Description

This strategy is the implementation of a Supervisory Control and Data Acquisition (SCADA) system to remotely operate, supervise and control the high and medium voltage infrastructure of KDM. This is an existing strategy identified by KDM with phase 1 of this project currently under construction. In terms of NRE this is an enabler project that will provide the required metering data at substation and MV feeder level across KDM required to carry out technical losses studies. In addition to this the metering made available as part of the SCADA project can be used to carry out energy balancing on the network providing visibility on areas of high losses.

Implementation of SCADA system at the following levels,

- SCADA Phase 1 - HV Substation
- SCADA Phase 2 - MV Switching Substations 11kV
- Smart Metering Phase 3 - MV/LV reticulation transformers 11kV/400V. There are around 1400 reticulation transformers installed on the KDM network and will therefore necessitate that this project be further divided into sub phases based on a prioritisation schedule that looks at aspects such as high loss areas and highly loaded areas. A pilot project has been considered in year 5 on completion of the SCADA phase 1 and 2 for 50 transformers.

5.3.4.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
T4	Implementation of SCADA System & Control Centre Phases 1-3	Technical	L	L	B/S	O

The funding availability for this strategy is considered budgeted for phase one of the SCADA project, with a need for additional sourced funding for future phases, two, three etc.

5.3.4.3 High level scope

Nr	T4 Implementation of SCADA System & Control Centre Phases 1-3	
	Scope	Roles & Responsibilities
1	Implementation of SCADA System Phase 1 (HV substations) and control room - Initiated project	Outsourced to service provider
2	Implementation of SCADA System Phase 2 - MV switching substations	Outsourced to service provider
3	Smart Metering Phase 3 - MV/LV Distribution transformers (Pilot Project for 50 reticulation transformers)	Outsourced to service provider

5.3.4.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- The current phase 1 project budgets are based on the actual budgeted cost of R21, 897, 591.00
- The switching substation costs were based on similar principles used for the substation phase an estimated to be around R700,000.00 per switching substation. The functional design cost is based on 10% of CAPEX at R70,00.00 per switching substation.
- The smart metering implementation costs were based on similar installations elsewhere at R28,000.000. The total cost for this only includes the pilot project and not the complete metering cost across the network.

T4 Implementation of SCADA System & Control Centre Phases 1-3									R 50,247,591
			Annual Quantity						
Equipment & Materials (Includes Installation)	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost	
SCADA Phase 1 - Major substations & Control Centre	1	R 21,897,591	1					R	21,897,591
SCADA Phase 2 - Switching Substations	35	R 700,000		12	12	11		R	24,500,000
Phase 3 Smart Metering at Distribution Transformers (Pilot 50 key distribution points)	1405	R 28,000					50	R	1,400,000
TOTAL Equipment & Materials								R	47,797,591

			Annual Quantity						
Other Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost	
SCADA Phase 2 Functional Design	35	R 70,000	35					R	2,450,000
TOTAL Other Costs								R	2,450,000

It can be noted that this strategy has a high CAPEX cost as the key function is SCADA which is a necessity for a utility of this nature. However, outputs that the SCADA project provides enables and supports other key activities required for TL and NTL reduction.

5.3.4.5 SMART implementation schedules

	Y1				Y2				Y3				Y4				Y5			
T4 Implementation of SCADA System & Control Centre Phase 1-3	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Implementation of SCADA System Phase 1 (HV substations) and control room - Initiated project	←																			
Implementation of SCADA System Phase 2 - MV switching substations							↔													
Smart Metering Phase 3 - MV/LV Distribution transformers															↔					

5.3.4.6 Risks & Mitigation measures

Nr	T4 Implementation of SCADA System & Control Centre Phase 1-3		
	Risk	Impact	Mitigation
1	Poor Delivery or implementaton of functional requirements by service provider	Reduced functionality in the SCADA system	Ensure that there is strict management of the contract and required functionality and address through remedial measures in the contract
2	Lack of internal capacity and training to operate and manage SCADA system	Failure to implement	Conduct needs analysis for internal operations and ensure required staffing and training has been addressed
3	Large number of electromechanical relays at switching substation level (SCADA phase 2) therefore limitations in relaying required statistical metering data	Existing breakers would need to be hardwired for control and the required MV metering data will not be available	Aged electromechanical relays to be replaced before or during SCADA implementation to ensure MV metering data for all feeders are available
4	Budget constraints as this project has high capital costs	Failure to implement future phases 2 and 3	Explore funding options available such as National Treasury

5.3.4.7 Procurement & Implementation options

SCADA phase 1 is in the implementation phase and has been funded by the EU and disbursed and managed via National Treasury. With respect to the following phases, an experienced service provider will need to be appointed to develop the functional design. These phases of strategy are recommended to be procured through a tender process. Funding needs to be sourced if not available internally through external grants.

5.3.5 Strategy T5 – Electrification & prepaid metering of informal settlements

5.3.5.1 Strategy Description

The electrification and prepaid metering of informal settlements is an already identified strategy by KDM.

One informal settlement has already been electrified as a pilot project, where 255 connections were installed in 2019. This was followed by the installation of a Data Concentrator Unit (DCU) that

monitors 106 of the meters for purchasing patterns. The pilot project ended in July 2021 with the following data findings:

- 1 DCU installed
- 106 meters monitored
- 7 recorded an under-voltage status
- 2 recorded a tamper status
- 17 had a negative credit balance
- 63 recorded zero consumption

Future plans as from the 2023/24 financial year for three years include the electrification and metering of the following two areas.

	Number of connections		
Ward 16 - Nyoniyamanzi extensions	450	500	350
Ward 13 - Lot 14 extensions	350	100	50

Only areas legitimately earmarked for informal settlements are planned to be electrified.

Electrifying and installing meters are one thing. Close monitoring of purchase patterns post commissioning and timeous reaction to possible problems are equally important to prevent the original project from collapsing and contributing to an even bigger losses situation and increased non-revenue energy. There is also the risk of resistance from the community to pay for electricity as this is deemed in certain social economic circles as a basic right and not a service to be paid for.

This strategy will thus benefit from the support of strategy I5 – Implementation of Data Warehousing and Business Intelligence platforms as well as S1 – Community Awareness.

5.3.5.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
T5	Electrification & prepaid metering of informal settlements	Technical	M	M	B	O

5.3.5.3 High level scope

Nr	T5 Electrification & prepaid metering of informal settlements	
	Scope	Roles & Responsibilities
1	Electricifation and installion of prepaid meters Ward 16 - Nyoniyamanzi extensions	External consultant
2	Electricifation and installion of prepaid meters Ward 13 - Lot 14 extensions	External consultant
3	Installation of Data Concentrator Units (DCU) for monitoring of meter purchasing patterns, incorparating into Data Warehouse and using Business Intelligence (BI) for data analysis	External consultant / Internal
4	Monthly ongoing data analysis of purchasing history, auditing of meters with no purchases for 90 days.	Internal / External consultant
5	Continuous community engagament & education re payment for services and dangers of electricity theft	Internal / External consultant

5.3.5.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- Contractor to install 1300 meters in Ward 16 Nyoniyamanzi extension, complete with secure pole top meter boxes. Contractor cost assumed at R 300 per installation.
- Contractor to install 500 meters in Ward 13 Lot 14 extension, complete with secure pole top meter boxes. Contractor cost assumed at R 300 per installation.
- Contractor to install one DCU per 100 meters = 22 DCU's. Contractor cost assumed at R 200 per DCU installation.
- Prepaid meters cost at R 1000 per meter.
- Pole top boxes assumed to take 6 prepaid meters = 367 boxes at R 500 per box.
- Supporting infrastructure including poles, cabling etc assumed at 3 times pole top box cost.

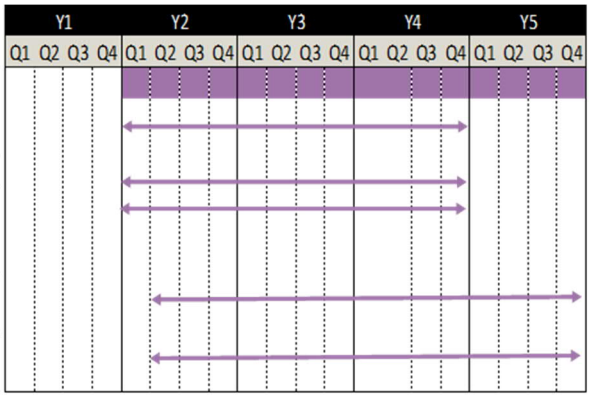
Table below provides and overview of the associate costs against assumed rates over the strategy period.

T5 Electrification & prepaid metering of informal settlements								R 9,682,133
			Annual Quantity					
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
Electrification Ward 16 Nyoniyamanzi extensions	1,300	R 300		450	500	350		R 390,000
Electrification Ward 13 Lot 14 extensions	500	R 300		350	100	50		R 150,000
Install DCU's	22	R 200		8	10	4		R 4,400
								R -
TOTAL Contractor / Consultant Costs								R 544,400

			Annual Quantity					
Equipment & Materials	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
PP Electricity meters	1,800	R 1,000		800	600	400		R 1,800,000
DCU's	22	R 200		8	10	4		R 4,400
Pole top boxes	367	R 5,000		133	167	67		R 1,833,333
Supporting infrastructure	367	R 15,000		133	167	67		R 5,500,000
TOTAL Equipment & Materials								R 9,137,733

5.3.5.5 SMART implementation schedules

T5 Electrification & prepaid metering of informal settlements
Electricifation and installion of prepaid meters Ward 16 - Nyoniyamanzi extensions
Electricifation and installion of prepaid meters Ward 13 - Lot 14 extensions
Installation of Data Concentrator Units (DCU) for monitoring of meter purchasing patterns, incorparating into Data Warehouse and using Business Intelligence (BI) for data analysis
Monthly ongoing data analysis of purchasing history, auditing of meters with no purchases for 90 days.
Continuous community engagament & education re payment for services and dangers of electricity theft



5.3.5.6 Risks & Mitigation measures

Nr	T5 Electrification & prepaid metering of informal settlements		
	Risk	Impact	Mitigation
1	Lack of funding	Failure to implement project	Source funding from other sources such as DMRE / LGBA
2	Shortage of internal resources / skills to implement project	Failure / delays to implement project	Outsourcing to external consultant
3	Lack / shortage of skills / experience internally for monthly analysis and investigation of no purchases / low purchases	Limited success on recovery of revenue	Outsourcing to external consultant
4	Failure / delays to implement Data Warehousing & BI platform	Limited to zero data analysiss for post commissioning actions	Outsourcing to experienced external consultant with their own Data Warehousing & BI platform
5	Community resistance, espcially in areas of poverty and community views that electricity is a basic right	Communal unrest, damage to infrastructure	Implementation of consumer awareness and education campaigns

5.3.5.7 Procurement & Implementation options

KDM has indicated that application will be made to the Department of Mineral Resources and Energy for funding. The project is expected to be outsourced to a qualifying service provider.

5.4 Financial Strategies

In line with the KDM Strategy document, this section can be further broken down into addressing Unbilled energy & Unpaid energy.

Unbilled energy relates to but are not limited to the following aspects:

- Faulty / unread meters
- Tampered meters
- Unmetered connections
- Meters in the field but not in financial system
- Faulty fuses

Unpaid energy relates to but are not limited to the following aspects:

- Faulty CT / VT ratios
- Incorrect tariff applications
- Unbilled accounts
- Underestimates
- Poor collection performance

The strategies contained in this section speaks directly to non-technical losses, being the area with the potential of having the biggest impact on losses.

High priority should thus be given to these strategies but bearing in mind that some strategies may be dependent on the successful implementation of other strategies.

5.4.1 Strategy F1 – LPU customer audits & consumption verification

5.4.1.1 Strategy Description

This strategy is contained in the **existing** KDM Energy losses strategy document under Focus Area 4 and also highlighted under T2 Ensure all LPU Customers on AMR in this strategy document. The strategy recommended here differs slightly from the one in the existing strategy document. Where the existing is aimed at looking at historical billing data (last 5 years), this strategy is more aimed towards a process where consumption gaps can be identified much quicker and corrective action taken as well

This strategy will work optimally with the successful implementation of strategy T2 but is not dependent on T2 being fully completed. This strategy can already be implemented on existing AMR customers and as and when other LPU customers are switched to AMR.

This strategy will benefit further from the implementation of a Data Management / Workforce Management System as highlighted under I5.

The strategy addresses **Unbilled Energy** and recommends the following steps:

- A data analysis and verification process after AMR data has been compiled for a specific month, but prior to uploading into Munsoft system for billing purposes.
- Investigate / Analyse causes of missing / inaccurate data and rectify causes.
- Consumption adjustment analysis, back billing calculation and compiling of report for finance to implement corrective billing.

From a municipal financial perspective, this strategy addresses Revenue Recovery as well as revenue enhancement.

It also contributes towards improved percentage (%) readings onto bill.

A pre-condition of this strategy is that back billing calculations can only be done for a period of three years, in line with existing KDM bylaws. No changes to the bylaw are suggested in this regard, as the three year period is aligned with the period described in the Debt Prescription Act.

5.4.1.2 Strategy Matrix

Strategy nr	Description	Category	Priority Matrix			
			Impact	Quick Win	Funding Availability	Technical Capacity
F1	LPU (MD) customer audits & consumption verification	Financial	H	H	S	O

This strategy is expected to produce high impact results over the short term and can be viewed as a "low hanging" fruit strategy.

5.4.1.3 High level scope

Nr	F1 LPU (MD) customer audits & consumption verification	
	Scope	Roles & Responsibilities
1	Monthly analysis of AMR data, prior to importing into billing system	AMR service provider and Dept Finance billing expert
2	Analyse / investigate causes of inaccurate / missing data	AMR Service provider
3	Address causes of inaccurate / missing data either through meter maintenance or deskptop data corrections	AMR Service provider (data) / Electricity department (meter maintenance)
4	Consumption adjustment analysis, back billing calculation and compiling of report for finance to implement corrective billing.	External consultant

5.4.1.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- Senior financial clerk at R 300 k per annum spending 16 hours per month analysing AMR data and importing into system.
- Electrical technician and assistant with vehicle at R 300 per hour at two hours per inspection doing 8 inspection per month = 493 over 5 years.
- AMR service provider cost for AMR data desktop analysis of missing / inaccurate data at R 200 per record. Records with missing / inaccurate data assumed at 40% of total AMR meters and to reduce to 5% over 5 years (implying 95% accuracy of readings onto bill)
- External consultant at R 1200 per back-billing calculations & report compilation. Records assumed at same as above.

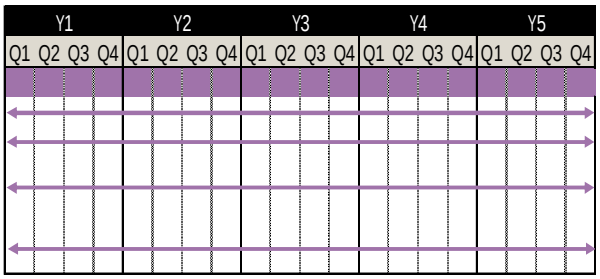
Table below provides and overview of the associate costs against assumed rates over the strategy period.

			Annual Quantity					
Human Resources	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
Senior Finance clerk	1	R 300,000	R 25,000.00	25000	25000	25000	25000	R 125,000
Electrical Technician, assistant & vehicle	1	R 300	197	197	197	197	197	R 295,500
								R -
								R -
TOTAL Human Resources								R 420,500

			Annual Quantity					
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
Desktop Analaysis of missing / inaccurate data	287	R 200	50	81	83	49	25	R 57,450
Back-billing calculations, report submission.	287	R 1,200	50	81	83	49	25	R 344,700
TOTAL Contractor / Consultant Costs								R 402,150

5.4.1.5 SMART implementation schedules

F1 LPU (MD) customer audits & consumption verification
Monthly analysis of AMR data, prior to importing into billing system
Analyse / investigate causes of inaccurate / missing data
Address causes of inaccurate / missing data either through meter maintenance or deskptop data corrections
Consumption adjustment analysis, back billing calculation and compiling of report for finance to implement corrective billing.



5.4.1.6 Risks & Mitigation measures

Nr	F1 LPU (MD) customer audits & consumption verification		
	Risk	Impact	Mitigation
1	Lack of skills in finance to accurately interrogate and analyse AMR data	Billing errors to customer due to incorrect tariff etc	Skills mprovement training of staff / Possible outsourcing of servcie to experienced consultants in the beginning with aim of eventual skills transfer to KDM billing staff
2	Sub-standard service by AMR service provider	Sub-standard data quality	Ensure stict management of contract against deliverables and address through remedial measures in contract, including if need be, termination of contract.
3	Possible by-law constraints on how far back customers can be back-billed (at least three years).	Limited success on recovery of revenue	Review bylaw and amend if needed to support strategy
4	Budget constraints for payment of external cosultant to do consumption adjustment analysis, back-billing calculation and compilation of corrective billing report.	Limited success on recovery of revenue	Consider appointment of consultants willing to work at risk and earn revenue based on succesfull recovery of revenue for municipality

5.4.1.7 Procurement & Implementation options

This strategy can be implemented without placing strain on the municipality's budgets by employing a risk – reward approach through the appointment of external consultants willing to perform the work at risk and earn rewards as a percentage of value of successful recovery of lost / missing revenue.

5.4.2 Strategy F2 – Bulk metering of stands with multiple prepaid meters

5.4.2.1 Strategy Description

In the status quo report it was highlighted that several stands have multiple prepaid meters linked to the stand. RA Moodly retirement Village in Stanger for example has 153 prepaid meters linked to the stand of which 130 are active and 23 are inactive. This places an additional burden on KDM resources to manage and maintain.

It is our understanding that the current KDM policy is to bulk meter stands with multiple dwellings on it. From the status quo report it is evident though that there are some "legacy" stands where meters have been installed in each dwelling on the stand.

This strategy recommends that these "legacy" stands also be bulk metered at a reseller's tariff with internal metering provided by a third party serving as reseller on behalf of the stand governing body.

The exception to this will be the metering of informal stands where it is still recommended that each dwelling be separately metered and is addressed under F4 – Electrification and prepaid metering of informal settlements.

Pre-condition to strategy – This strategy is dependent upon the municipality successfully implementing relevant bylaws and policies to allow the municipality to disconnect customers

beyond the bulk meter who are indebted to the municipality in terms of rates and other service charges. The responsibility for this will be the legal department. The utility reserves the right for disconnection.

5.4.2.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
F2	Bulk metering of stands with multiple prepaid meters	Financial	M	M	S	O

5.4.2.3 High level scope

Nr	F2 Bulk metering of stands with multiple prepaid meters	
	Scope	Roles & Responsibilities
1	Identify & list stands with multiple prepaid meters	KDM electricty dept
2	Develop program and schedule for replacement over 3 years	KDM electricty dept
3	Put work out on tender with defined scope & deliverables& appoint SP	KDM SCM dept
4	Effect replacements against schedule, ensure meter active against correrct account and tariff on stand and all prepaid meters terminated	Service provider
5	Liaise with stand governing body to implement 3rd party metering supply per dwelling	KDM electricty dept / Service provider

5.4.2.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- Stands with 7 or more linked prepaid meters to be replaced with bulk metering. (59 stands with 971 prepaid meters in total)
- Contractor cost per meter installation at R 600 per meter.
- Contractor cost per removal of individual meter at R 150 per meter.
- Bulk meter material cost at R 5000 per meter.

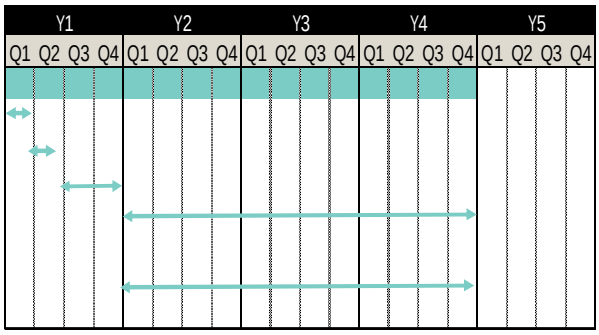
Table below provides and overview of the associate costs against assumed rates over the strategy period.

F2 Bulk metering of stands with multiple prepaid meters								R 476,050
			Annual Quantity					
Contractor / Consultant Costs	Number	Cost/activity	Y1	Y2	Y3	Y4	Y5	Total cost
Installation of bulk meters at stands 7 meters +	59	R 600	0	15	20	24		R 35,400
Removal of individual meters	971	R 150	0	557	236	178		R 145,650
								R -
								R -
								R -
								R -
TOTAL Contractor / Consultant Costs								R 181,050

			Annual Quantity					
Equipment & Materials	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
Bulk Electricity meters	59	R 5,000	0	15	20	24		R 295,000
								R -
								R -
TOTAL Equipment & Materials								R 295,000

5.4.2.5 SMART implementation schedules

F2 Bulk metering of stands with multiple prepaid meters
Identify & list stands with multiple prepaid meters
Develop program and schedule for replacement over 3 years
Put work out on tender with defined scope & deliverables & appoint SP
Effect replacements against schedule, ensure meter active against correrct account and tariff on stand and all prepaid meters terminated
Liaise with stand governing body to implement 3rd party metering supply per dwelling



5.4.2.6 Risks & Mitigation measures

Nr	F2 Bulk metering of stands with multiple prepaid meters		
	Risk	Impact	Mitigation
1	Lack of resources (excluding financial)	Failure to implement, no change to identified need in status quo	Outsource to external service provider through tender process
2	Lack of financial resources	Failure to implement, no change to identified need in status quo	Explore alternative available funding options for local government (SALGA, national Teasury etc)
3	Sub-standard / poor quality service by service provider	Poor workmanship, schedule delays	Ensure stict management of contract against deliverables and address through remedial measures in contract, including if need be, termination of contract.
4	Resistance from property governing bodies to implement 3rd party metering internally	Limited success in implementation	Ensure by-laws supports policy to bulk meter stands with multiple dwellings.

5.4.2.7 Procurement & Implementation options

This strategy is recommended to be procured through a tender process. Funding needs to be sourced if not available internally through the options available to local government for obtaining funding.

5.4.3 Strategy F3 – SPU customer metering / vending assurance

5.4.3.1 Strategy Description

During the status quo stage it was determined that approximately 35% of conventional customers are billed estimates (interims). It implies that percentage readings onto bill is in the region of 65%, against a benchmark of 90%. This can be attributed to any or a combination of the following:

- Tampered meters
- Faulty meters
- Access to meter problems
- Meters on the system but not in the field
- Meters in the field but not on the system

The impact for the municipality is a risk that revenue can be overstated as estimates have the risk of being overstated as compared to actual consumption. Energy balancing cannot be done properly due to low levels of information on actual consumption.

The **existing** KDM Energy losses strategy document speaks to this strategy to a certain extent. The strategy proposed here can be viewed as an enhancement of this strategy.

In the status quo report, it was also highlighted that a large percentage of prepaid customers are not purchasing electricity and that 42% have not purchased in a period of 12 months. This can be attributed to any or a combination of the following:

- Electricity theft through tampered meters
- Faulty meters
- Ghost vending
- Meters in the system, but not in the field
- Meters in the field but not on the system

This strategy is aimed at reduction in **Unbilled energy** as well as **Unpaid energy**. From a conventional meter point of view, it also supports improvement in percentage readings onto bill.

The strategy is proposed to involve the following steps:

- Auditing of stands with no record of a meter and ensuring meter uploaded to system(s).
- Data clean-up and mirroring of Munsoft and Prepaid system information
- Auditing of conventional meters being interim billed
- Expansion of meter fault code list to be more indicative of problem at meter.
- Outsourcing of meter reading service to a Meter Reading Contractor (MRC). The motivation behind this is to reduce the cost of meter reading by paying per meter read, effectively rewarding the MRC for efforts to get as many meters read as possible.
- Monthly inspections of conventional meters appearing on the faulty meters list and appropriate remedial action (meter repair / replacement).
- Auditing of prepaid meters showing no purchasing for more than 90 days.
- Monthly ongoing data analysis of prepaid purchasing history, auditing of meters with no purchases for 90 days.
- Targeted audits of areas where prepaid meters show purchases lower than the expected benchmark for the specific area
- Fining of consumers tampering with meters, back billing calculations and compiling of report for finance department to levy against consumer account.
- This strategy can also benefit from a community awareness programme linked a CRM system where customers can provide readings to the municipality as well, especially in cases where it is difficult to gain access to the meter during working hours.

5.4.3.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
F3	SPU customer metering / vending assurance	Financial	M	M	B	O

5.4.3.3 High level scope

Nr	F3 SPU customer metering / vending assurance	
	Scope	Roles & Responsibilities
1	Auditing of stands with no record of a meter	External consultant
2	Data clean-up and mirroring of Munsoft and Prepaid system information	External consultant
3	Auditing of conventional meters being estimated	External consultant
4	Review of meter fault code list	External consultant
5	Appointment of external Meter Reading Contracting company to read conventional meters	External consultant
6	Inspections of meters appearing on the faulty meters list & appropriate remedial action	External consultant
7	Auditing of prepaid meters showing no purchasing for more than 90 days	External consultant
8	Monthly ongoing data analysis of prepaid purchasing history, auditing of meters with no purchases for 90 days.	External consultant
9	Targeted audits of areas where prepaid meters show purchases lower than the expected benchmark for the specific area	External consultant
10	Fining of consumers tampering with meters, back billing calculations and compiling of report for finance department to levy against consumer account	External consultant

5.4.3.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- 4704 Stands to be audited having no meter in the system at R 300 per stand.
- For conventional:
    - Contractor to audit approximate 3 974 meters (35% of 11 354 SPU conventional meters) at a cost of R 300 per meter.
    - Assume 50% of audited requires replacement.
    - Assume contractor cost for meter replacement at R 300 per meter.
    - Assume meter cost at R 1000 per meter.
- For prepaid
    - Discard 791 meters to be replaced with bulk metering as per F2, inspect 26 934 meters at R 300 per meter. Evenly spread over 5 years.
    - 20% of inspected meters will require back-billing calculation & report submission at R 1000 per meter.

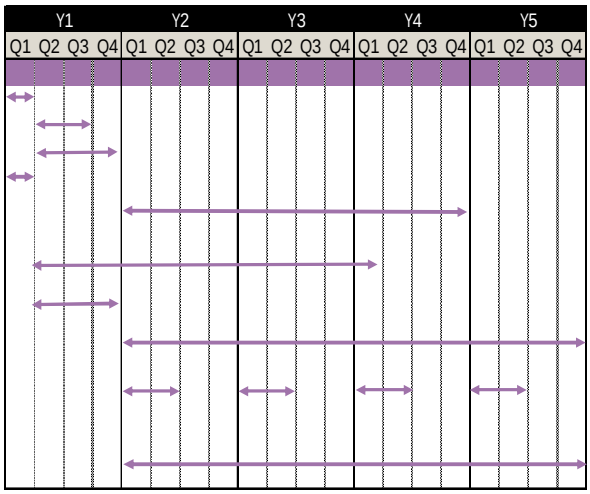
Table below provides and overview of the associate costs against assumed rates over the strategy period.

F3 SPU customer metering / vending assurance									R 18,653,500
			Annual Value						
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost	
Audit stands with no meter	4,704	R 300	4,704					R	1,411,200
Audit conventional meters not being billed	3,974	R 300	3,974					R	1,192,200
Replace faulty meters	1,987	R 300	1,987					R	596,100
Audit PP stands with no purchase 90 days	26,934	R 300	5,387	5,387	5,387	5,387	5,387	R	8,080,200
Audit stands low purchase targeted areas								R	-
Back-billing calculation & report compilation	5,387	R 1,000.00	1,077	1,077	1,077	1,077	1,077	R	5,386,800
TOTAL Contractor / Consultant Costs								R	16,666,500

Equipment & Materials	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost	
Meter	1,987	R 1,000	1,987					R	1,987,000
								R	-
TOTAL Other Costs								R	1,987,000

5.4.3.5 SMART implementation schedules

F3 SPU customer metering / vending assurance
Auditing of stands with no record of a meter
Data clean-up and mirroring of Munsoft and Prepaid system information
Auditing of conventional meters being estimated
Review of meter fault code list
Appointment of external Meter Reading Contracting company to read conventional meters
Inspections of meters appearing on the faulty meters list & appropriate remedial action
Auditing of prepaid meters showing no purchasing for more than 90 days
Monthly ongoing data analysis of prepaid purchasing history, auditing of meters with no purchases for 90 days.
Targeted audits of areas where prepaid meters show purchases lower than the expected benchmark for the specific area
Fining of consumers tampering with meters, back billing calculations and compiling of report for finance department to levy against consumer account



5.4.3.6 Risks & Mitigation measures

Nr	F3 SPU customer metering / vending assurance		
	Risk	Impact	Mitigation
1	Lack of skills / experience internally to analyse and clean data up	Sub-standard mirroring of data in finance system and pepaid system	Outsourcing to external consultant
2	Insufficient internal staff to perform onpging meter audits	Continious challenges with meters not purchasing	Outsourcing to external consultant
3	Lack / shortage of skills / experience internally for monthly analysis and investigation of no purchases / low purchases	Limited success on recovery of revenue	Outsourcing to external consultant
4	Community resistance, espcially in areas of poverty and community views that electricity is a basic right	Communal unrest, damage to infrastructure	Implementation of consumer awareness and education campaigns

5.4.3.7 Procurement & Implementation options

This strategy can be implemented through a combination of budgeting for these services by an external consultant, and risk-reward from recovery of unbilled energy through discovery of tampered meters and back-billing of customers.

5.4.3.8 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- Cost for auditing of stands with no record of meter already factored into F2: Prepaid vending assurance.

Table below provides and overview of the associate costs against assumed rates over the strategy p

F5 Conventional SPU customer billing assurance									R	5,608,876
			Annual Quantity							
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5		Total cost	
Audit meters not being billed	5904	R 300	5904						R	1,771,224
Replace faulty meters	2952	R 300	2952						R	885,612
									R	-
TOTAL Contractor / Consultant Costs									R	2,656,836

			Annual Quantity						
Equipment & Materials	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost	
Prepaid meters	2,952	R 1,000	2,952					R	2,952,040
								R	-
TOTAL Other Costs								R	2,952,040

F5 Conventional SPU customer billing assurance								R 5,608,876
			Annual Quantity					
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
Audit meters not being billed	5904	R 300	5904					R 1,771,224
Replace faulty meters	2952	R 300	2952					R 885,612
								R -
TOTAL Contractor / Consultant Costs								R 2,656,836

			Annual Quantity					
Equipment & Materials	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
Prepaid meters	2,952	R 1,000	2,952					R 2,952,040
								R -
TOTAL Other Costs								R 2,952,040

5.4.3.9 Procurement & Implementation options

Conventional meter maintenance is a normal budgetary requirement. From the KDM Energy losses strategy document it is evident that it is budgeted for and that a contract is in place for an external service provider to execute repairs / installations.

5.4.4 Strategy F4 – Review of credit control processes & activities

5.4.4.1 Strategy Description

It has already been mentioned that the **existing** KDM Energy losses strategy document recognises improving **Unpaid Energy.** Strategy F4 is aimed at ensuring acceptable collection rates from conventional customers. This strategy will not necessarily impact energy losses, but in a necessary strategy to ensure revenue is collected from expected improvement in **Unbilled Energy** contained in the other strategies.

The high percentage of aged debtors suggest that collection of revenue in general (not just energy) is a challenge.

Improvement of credit control processes and collections is proposed to involve the following steps:

- Consider outsourcing of management of the following credit control activities
    - Management of final notices
    - Management of disconnections
    - Management of revisits
    - Management of reconnections
- Implement use of digital technology for credit control quality assurance and performance management. Replace paper process with recording of completed activities on mobile devices with photo proof. This is a necessary requirement especially where contractors are used to execute credit control actions as the information recorded on the mobile device provide proof to KDM that the contractor executed the work correctly. It allows for better decisions when it comes to processing of contractor invoices as there are proof of work executed, and work not executed cannot be claimed by the contractor. Sub-standard work can also be penalised in line with contract requirements, for instance disconnection of customer outside of contracted turnaround times.
- Manage processes through the proposed Data and Workforce management system for complete record purposes and performance reporting

5.4.4.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
F4	Review of credit control processes & activities	Financial	L	L	B	I/0

5.4.4.3 High level scope

Nr	F4 Review of credit control processes & activities	
	Scope	Roles & Responsibilities
1	Outsource Management of Credit control activities	External consultant
2	Introduce digital mobile technlogy for activities execution and quality control	External consultant
3	Manage processes through proposed Data & Workforce Management system	Internal / External consultant

5.4.4.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- Payment defaulters at 50% of total debtors book.
- Customers to be disconnected at 50% of those having received final notices.
- Reconnecting customers at 60% of those disconnected.
- Reduction in debtor book at 20% per annum
- Contractor cost for final notice at R 50 per notice, Disconnections, and reconnections at R 200 per activity.

Table below provides and overview of the associate costs against assumed rates over the strategy period.

F6 Review of credit control processes & activities									R	2,908,895
			Annual Quantity							
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost		
Delivering of final notices	13852	R 50	5677	4542	3633			R	692,594	
Disconnection of defaulters	6926	R 200	2839	2271	1817			R	1,385,188	
Reconnection of customers that paid	4156	R 200	1703	1362	1090			R	831,113	
TOTAL Contractor / Consultant Costs								R	2,908,895	

5.4.4.5 SMART implementation schedules

	Y1				Y2				Y3				Y4				Y5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
F4 Review of credit control processes & activities																				
Outsource Management of Credit control activities																				
Introduce digital mobile technlogy for activities execution and quality control																				
Manage processes through proposed Data & Workforce Management system																				

5.4.4.6 Risks & Mitigation measures

Nr	F4 Review of credit control processes & activities		
	Risk	Impact	Mitigation
1	Lack / shortage of skills to implement proper credit control management strategies	Debtors book remains high and aged	Outsourcing to external consultant
2	Insufficient budget to pay external service provider, or poor return on results from external service provider	Interrupted service due to lack of payment to SP or fruitless expenditure	Consider implementing risk-reward funding model

5.4.4.7 Procurement & Implementation options

Consideration should be given to outsource service on a risk - reward model where an external consultant gets rewarded based on successful collection of revenue from the credit control activities.

5.5 Institutional Strategies

The strategies contained herein are not considered to have a high impact on reduction in losses and subsequent revenue increase but are deemed necessary to enable the optimal implementation of the strategies that are expected to have a high impact.

5.5.1 Strategy I1 – Intra- & Interdepartmental Standard Operating Procedures enhancement

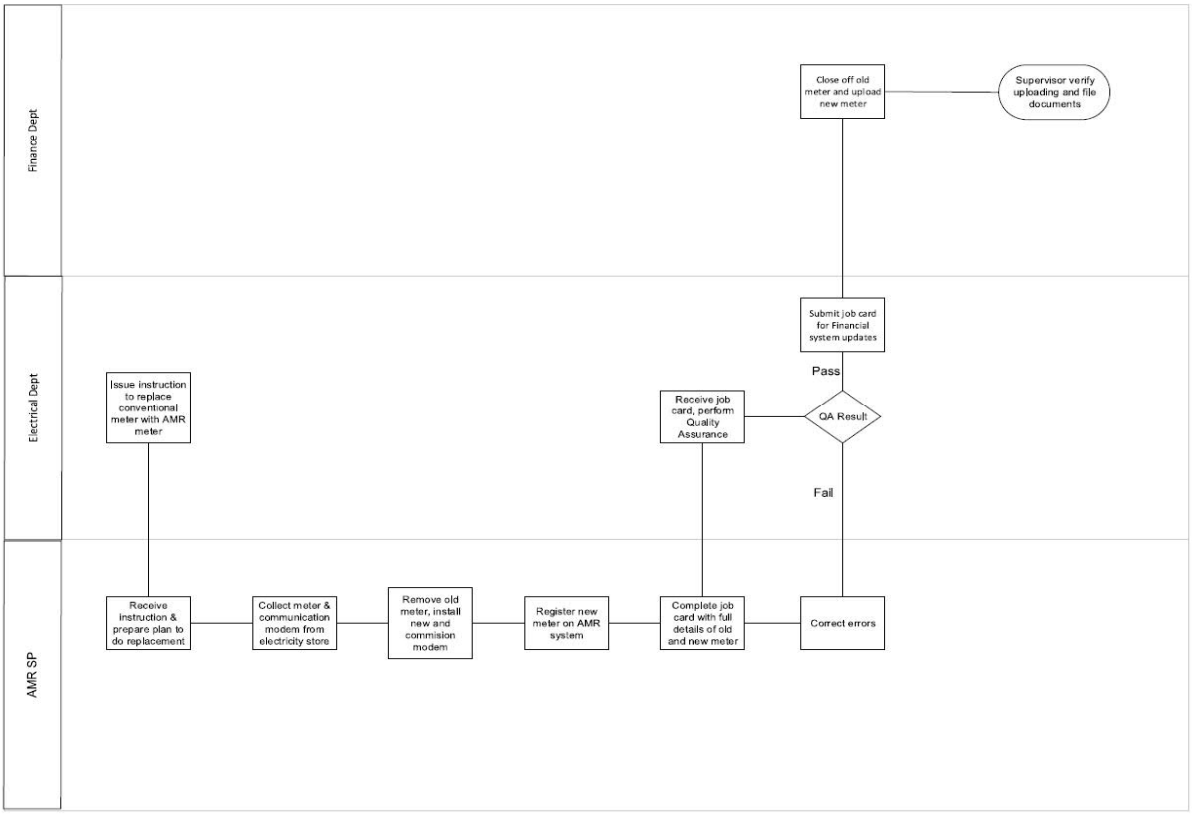
5.5.1.1 Strategy Description

This strategy is aimed at improving cooperation intra- and inter department, as well as external service providers if any.

The strategy is additional to the **existing** KDM energy losses strategy.

The strategy is proposed to contain the following elements:

- Process flow procedures with “Swim lanes” highlighting the flow of work as well as the responsible department / service provider. Below diagram is an example of how a process flow will typically look.



- Drawing up of SLA between departments / service providers to ensure clear understanding of roles and responsibilities as well as deliverable time frames.
- Drawing up of Key Performance Indicators (KPI’s) linked to SLA for purposes of performance management

- It is recommended that the process be outsourced to an organizational development consultant.

5.5.1.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
I1	Intra- & Interdepartmental Standard Operating Procedures enhancement	Institutional	L	L	B	O / I

5.5.1.3 High level scope

Nr	I1 Intra- & Interdepartmental Standard Operating Procedures enhancement	
	Scope	Roles & Responsibilities
1	Draw process flow type SOP for each work process	External consultant
2	Develop SLA & incorporate process flows into document	External consultant
3	Develop KPI's based on SLA	Internal / External Consultant
4	Manage performance accordingly	Internal

5.5.1.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- Consultant hours to develop Workflow SOPs = 300 hours.
- Consultant hours to develop SLA & Incorporate SOPs = 150 hours.
- Consultant hours to develop KPI's in line with SLA = 150 hours.
- Consultant rate per hour = R 700.

Table below provides and overview of the associate costs against assumed rates over the strategy period.

I1 Intra- & Interdepartmental Standard Operating Procedures enhancement									R	420,000
			Annual Quantity							
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost		
Draw process flow type SOP for each work process	300	R 700	300					R	210,000	
Develop SLA & incorporate process flows into	150	R 700	150					R	105,000	
Develop KPI's based on SLA	150	R 700	150					R	105,000	
TOTAL Contractor / Consultant Costs								R	420,000	

5.5.1.5 SMART implementation schedules

	Y1				Y2				Y3				Y4				Y5			
I1 Intra- & Interdepartmental Standard Operating Procedures enhancement	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Draw process flow type SOP for each work process																				
Develop SLA & incorporate process flows into document																				
Develop KPI's based on SLA																				
Manage performance accordingly																				

5.5.1.6 Risks & Mitigation measures

Nr	I1 Intra- & Interdepartmental Standard Operating Procedures enhancement		
	Risk	Impact	Mitigation
1	Lack / shortage of skills to implement	Processes, SLA's and KPI's remain sub-standard to a high performing entity	Outsourcing to organisational improvement external consultant
2	Staff resistance	Sub-standard implementation	Staff involvement throughout process to ensure maximum buy-in

5.5.1.7 Procurement & Implementation options

It is assumed that costs for this strategy have not been budgeted for at time of presenting this strategy document and is suggested to be reviewed at half year budget review and implemented from the third quarter of the financial year.

5.5.2 Strategy I2 – Tariff study & review

5.5.2.1 Strategy Description

The **existing** KDM Energy losses strategy document mentions Resolution 46: Tariff review and development but does not go into detail re this strategy. The fact that it does get mentioned indicate therefore and in line with our recommendations of a tariff study and review as well.

It was established that a tariff study and review was in an advanced stage. This strategy therefore includes the steps to be completed and next stapes.

5.5.2.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
I2	Tariff study & review	Institutional	L	L	B	O

5.5.2.3 High level scope

Nr	I2 Tariff study & review	
	Scope	Roles & Responsibilities
1	Finalize current process of developing tariffs and cost of supply study.	Service provider
2	Obtain NERSA aproval	Internal / Service Provider
3	Impelement approved new tariff structure	Internal

5.5.2.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- Consultant hours to assess current tariff methodologies & identify shortcomings = 350 hours.
- Consultant hours to identify losses & impact thereof and propose controls & remedial action = 150 hours
- Consultant hours to develop appropriate tariff methodologies = 150 hours.
- Consultant hours to develop simulated budget and indicative impact of recommended methodologies = 150 hours.
- Consultant rate per hour = R 1000.

Table below provides and overview of the associate costs against assumed rates over the strategy period.

I2 Tariff study & review								R 780,000
			Annual Quantity					
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
Hours - Assessment of tariff methodologies & ID of shortcomings	350	R 1,000	350					R 350,000
Hours Loss Identification	150	R 1,000	150					R 150,000
Hours Tariff setting methodologies recommendations	150	R 1,000	150					R 150,000
Hours Budget preparation	130	R 1,000	130					R 130,000
TOTAL Contractor / Consultant Costs								R 780,000

5.5.2.5 SMART implementation schedules

	Y1				Y2				Y3				Y4				Y5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
I2 Tariff study & review																				
Finalize current process of developing tariffs and cost of supply study.	↔																			
Obtain NERSA aproval		↔																		
Impelement approved new tariff structure				↔																

5.5.2.6 Risks & Mitigation measures

Nr	I2 Tariff study & review		
	Risk	Impact	Mitigation
1	Under performing consultant	Sub-standard recommendations for implementation	Enure clearly defined scope, deliverables, and performance management clauses
2	Failure to implement recommended practices	Strategy failure, impacting optimal implentation of other strategies	Ensure implementation by linking resonsiblities to roles and link KPI's

5.5.2.7 Procurement & Implementation options

It is recommended that National treasury and specifically the National Treasury Local Government Budget Analysis (LGBA) Chief directorate be approached for assistance in funding the implementation of this strategy.

5.5.3 Strategy I3 – Implementation of KDM CRM system

5.5.3.1 Strategy Description

This strategy is an **existing** strategy under the Vuthela iLembe LED support programme.

The feasibility study was completed in June 2020. The next phase would have been the establishment of a Regional Customer Care Centre with supporting CRM software system. This project has however been withdrawn due to limited participation by member municipalities.

KDM however aims to implement its own CRM system, currently partially in place with a telephone call centre and complaints being logged on the electrical maintenance software. The aim is to have an independent CRM system within a customer contact centre.

This strategy will also serve to enable the Social Intervention Strategy, and specifically the establishment of communication channels (e-mail and WhatsApp).

5.5.3.2 Strategy Matrix

Strategy nr	Description	Category	Priority Matrix			
			Impact	Quick Win	Funding Availability	Technical Capacity
I3	Implementation of KDM CRM system	Institutional	L	L	B	O

5.5.3.3 High level scope

Nr	I3 Implementation of KDM CRM system	
	Scope	Roles & Responsibilities
1	Establish Customer Care Center	Internal/ External
2	Procure & Implement CRM software	Internal / Service provider
3	Monitor performance against Customer Service Charter	Internal

5.5.3.4 Cost Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- Consultant hours to establish call centre & make operational = 350 hours.
- Consultant hours to supply and implement software & train staff = 150 hours
- Software procurement costs = R 25 000.
- Software management & support cost = R 2 500 per month

I3 Implementation of KDM CRM system									R	675,000
			Annual Quantity							
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost		
Establishment of Customer Care Call Centre	350	R 1,000	350					R	350,000	
CRM system implementation & staff training	150	R 1,000	150					R	150,000	
TOTAL Contractor / Consultant Costs								R	500,000	
Software Cost	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost		
System procurement	1	R 25,000	1					R	25,000	
System management & support per month	1	R 2,500	R 30,000	R 30,000	R30,000	R30,000	R30,000	R	150,000	
TOTAL Software Cost								R	175,000	

5.5.3.5 SMART implementation schedules

I3 Implementation of KDM CRM system	Y1				Y2				Y3				Y4				Y5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Establish Customer Care Center	↔																			
Procure & Implement CRM software	↔																			
Monitor performance against Customer Service Charter	→																			

5.5.3.6 Risks & Mitigation measures

Nr	I3 Implementation of KDM CRM system		
	Risk	Impact	Mitigation
1	Call centre not supported by other service improvement strategies	Dimished result in implementation	Continuous stakeholder engagement to obtain buy-in and ensure implementation of other strategies

5.5.3.7 Procurement & Implementation options

The implementation of a Customer Care Centre with supporting CRM system is understood to be planned and as such assumed to be budgeted for. It is recommended that the implementation thereof be outsourced to specialists in this discipline.

5.5.4 Strategy I4 – Implementation of single platform iLembe Indigent Management System

5.5.4.1 Strategy Description

This strategy is also an **existing** strategy identified under the Vuthela iLembe LED support programme. The strategy's aim is to establish a single platform IT system through which indigent registers can be maintained by the various local municipalities. The system will ensure uniformity of management of indigents as well as reporting. The system should be geared towards making it easier for LMs to manage their indigent registers.

Specific requirements should include:

- Web and cloud based.
- Stringent Security
- Audit trail functionality

Draft Terms of Reference are in the process of being finalized. This strategy's implementation is also subject to the signing of Memorandum of Agreements between the various municipalities.

5.5.4.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
I4	Implementation of single platform iLembe Indigent Management System	Institutional	L	L	B	O

5.5.4.3 High level scope

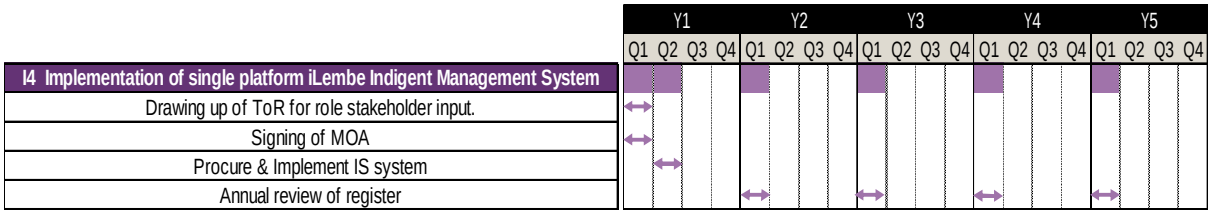
Nr	I4 Implementation of single platform iLembe Indigent Management System	
	Scope	Roles & Responsibilities
1	Drawing up of ToR for role stakeholder input.	Internal
2	Signing of MOA	Internal
3	Procure & Implement IS system	Internal / Service provider
4	Annual review of register	Internal

5.5.4.4 Cost Estimation

The cost for this strategy is a PFM cost and is shown for information purpose only.

Component	Project No	Project Name	Project value (incl VAT)	Source of funds
PFM	VILP027	IT Systems to support Indigent registers across the district	R 3,510,000.00	PFM core budget

5.5.4.5 SMART implementation schedules



5.5.4.6 Risks & Mitigation measures

Nr	I4 Implementation of single platform iLembe Indigent Management System		
	Risk	Impact	Mitigation
1	Resistance from member municipalities	Failure / delays to implement strategy	Continuous stakeholder engagement to obtain buy-in

5.5.4.7 Procurement & Implementation options

This strategy also falls under the Vuthela EMP projects and therefore will be procured from Vuthela EMP budgets.

5.5.5 Strategy I5 – Implementation of Data Warehousing & Business Intelligence Platforms

5.5.5.1 Strategy Description

It was highlighted during the Status Quo phase, that a system through which data can be stored from various sources / systems and supported by a Business Intelligence system where data can be monitored and managed was identified as a need.

The KDM Electricity has also identified this as a need and have already started initial planning towards a Data Warehousing system and Business Intelligence system.

Data Warehousing (DWH)

A data warehouse (DWH**)** can be described as a non-operational (non-real time) system mainly used for decision support and to support Business Intelligence. It provides query-optimized data for the users of the DWH system. The data warehouse should provide “a single version of truth” within the enterprise

The purpose of a data warehouse (DWH) is to build a unified layer that contains data from all relevant data sources throughout the enterprise. This implies the need to integrate data from multiple systems and optimize it for analysis and business intelligence. A data warehouse does not generate any data of its own and any data quality issues are either within the source systems or arose because of how data is interpreted in different systems. If data quality is overlooked, data warehouse users will have inaccurate and/or incomplete datasets. This translates directly to data not being representative and to erroneous analytics.

The implementation of a data warehouse would provide a single version of the truth from data taken from all systems and would build-up a history of information that would be useful for data analysis.

KDM have identified data from the following systems to be gathered and stored in a Data Warehousing system.

- Conventional metered customer metering data from the Munsoft Financial System
- Prepaid meter customer data from the Contour Technologies vending system and other similar supplier back-end systems such as Conlog's Power Nova and Landis & Gyr's Suprima system should these be considered to be procured.
- Customer management system data (to be procured)
- Advanced metering infrastructure / meter data management system (planned for possible future implementation.
- Financial Asset register information from Munsoft financial system
- Computerised asset management system (Pragma Onkey)
- Geographical Information System (ESRI)
- SCADA
- Human Resources
- Outage Management System (OMS)

It is our understanding that KDM currently has a licence for Microsoft SQL, which may be configured to accommodate the planned Data Warehousing project.
Data warehousing can be deployed on premise, but recent trends see many vendors offer cloud-based solutions. Some of the major vendors includes Amazon Web Services (AWS), Google Cloud (BigQuery), Microsoft Azure etc.

It is recommended that a thorough needs analysis and system design be undertaken to ensure the correct system to be procured or current system reconfigured.

Business Intelligence (BI)

A BI solution can use information from a Data Warehouse as described above (where all the pertinent information is available from a common source). BI functionality can however also be deployed on standalone databases. In the context of this strategy proposal, it is suggested as a supplementary solution to the Data Warehouse implementation strategy.

A BI solution can be configured to perform a variety of data analysis processes such as:

- Energy balancing calculations based on network metering and customer meter consumption data.
- Prepaid meter purchasing history
- Systems data comparison – useful for ensuring data in financial system and supplementary systems such as Prepaid meter data system and AMR system are mirrored.

Various commercial-off-the-shelve BI solutions exists that can be considered for implementation. In its simplest form BI is available in desktop tools such as MS Excel, but for the purposes of this strategy document, a more formalised and dedicated BI environment is envisioned that will service the Energy Department as well as Financial Department requirements.

A BI solution can be deployed on premise, or it can be deployed on cloud (software as a service).

The recommendation is once again that KDM undertake a thorough needs analysis and system design prior to procurement

Below websites are from different known vendors that offers solutions in this regard:

- https://powerbi.microsoft.com/en-us/
- https://www.cluvio.com/
- https://www.powermyanalytics.com/home
- https://www.revealbi.io/
- https://www.bcx.co.za/solutions/analytics/

This strategy is considered essential for the following reasons:

- Validation of data prior to uploading into the financial management system.
- Data mirroring management of data to be mirrored in financial system and supplementary systems.
- Data reporting and analysis for purposes of addressing issues such as meters not purchasing electricity, energy balancing etc.
- Progress reporting on, for example percentage readings onto bill.

It serves therefor as an enabler strategy for some of the other strategies presented herein.

5.5.5.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
I5	Implementation of single platform iLembe Data & Workforce Management System	Institutional	M	L	B	O

5.5.5.3 High level scope

Nr	I5 Implementation of Data Warehousing & Business Intelligence (BI) platforms	
	Scope	Roles & Responsibilities
1	**Data Warehousing** Establish needs & Design system Procure system adressing specific needs Implementation & training	Internal / Outsourced
2	**Business Intelligence** Establish needs & Design system Procure system that addresses needs Implementation & training	Internal / Outsourced

5.5.5.4 Costs Estimation

For the cost estimation of this strategy, the following assumptions have been made:

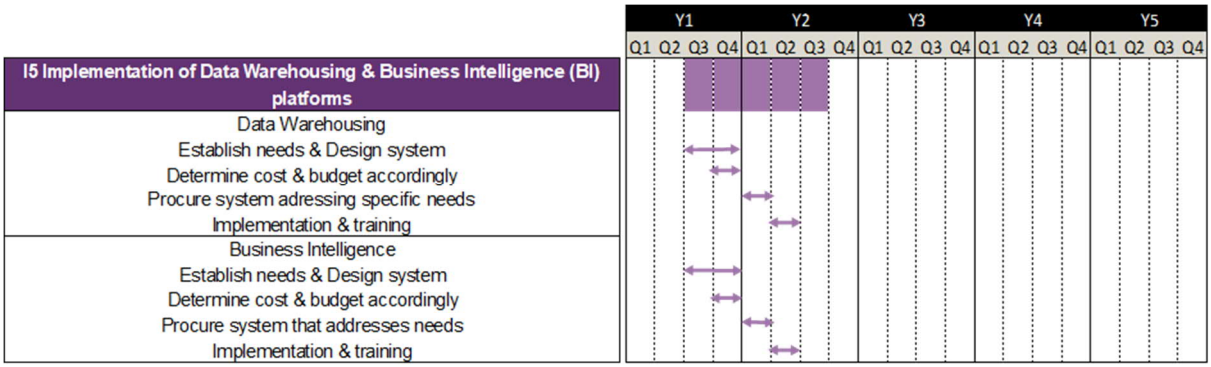
- For Data Warehouse design and setup:
  - Snr SQL system engineer at R 500/h for 1000 hours
  - Jnr SQL programmer at R 250/h for 1000 hours.
  - Monthly operational support of system and configuration management at R 25 000 per month.
  - Cloud hosting service (MS Azure as an example) at R 25 000 per month.
- For Business Intelligence solution:
  - Half the costs of DWH design and setup.

Table below provides and overview of the associate costs against assumed rates over the strategy period.

I5 Implementation of Data Warehousing & Business Intelligence (BI) platforms										
				Annual Quantity						
Software Cost - DWH	Number		Cost/Item	Y1	Y2	Y3	Y4	Y5		Total cost
System Design	1	R	500,000	1					R	500,000
System Development & Testing	1	R	250,000	1					R	250,000
System operational support / configuration management	5	R	300,000	1	1	1	1	1	R	1,500,000
Cloud hosting (MS Azure)	5	R	300,000	1	1	1	1	1	R	1,500,000
TOTAL Software Cost - DWH									R	3,750,000

				Annual Quantity						
Software Cost - BI	Qty		Cost/Item	Y1	Y2	Y3	Y4	Y5		Total cost
System Design	1	R	250,000	1					R	250,000
System Development & Testing	1	R	125,000	1					R	125,000
System operational support / configuration management	5	R	150,000	1	1	1	1	1	R	750,000
Cloud hosting (MS Azure)	5	R	150,000	1	1	1	1	1	R	750,000
TOTAL Software Cost - BI									R	1,875,000

5.5.5.5 SMART implementation schedules



5.5.5.6 Risks & Mitigation measures

I5 Implementation of Data Warehousing & Business Intelligence (BI) platforms		
Risk	**Impact**	**Mitigation**
Budget constraints to fund strategy	Failure to implement strategy	Thorough needs analysis, design and costing for budget pruoses in folloiwng financial year procurement
Lack of skills from staff to properly use sytems	Sub-standard implementation	Training of users must form part of implementation phase. Continued support from service provider in the form a call centre support, online manuals etc
Implementation of one platform without the other	Limited functionality, nagatively impacting other strategies dependant on this strategy	Drive implementation as a single solution, not one solution supplementing the other.

5.5.5.7 Procurement & Implementation options

It is recommended that this item be budgeted to be implemented in the following financial year, doing system needs analysis and design in the current financial year as well as cost determination.

5.5.6 Strategy I6 – Establishment of Revenue Protection Unit

5.5.6.1 Strategy Description

KDM have indicated a planned Revenue protection team within their planned future organograms. This proposal aims to highlight this as a strategy and not just a planned organogram.

To effectively execute many of the projects and initiatives proposed in the strategy document will require skilled project managers and supporting personnel. For this purpose, a dedicated Revenue Protection Unit (RPU) is proposed. This could also be described as a project management office (PMO). The RPU is considered a crucial function as it is proposed that it will coordinate and manage the implementation of the several of the other strategies for example:

- T1 – Eskom POS metring assurance
- T2 – Ensure all LPU customers on functional AMR
- F1 – LPU customer audits & consumption verification
- F3 – SPU customer metering / vending assurance

Without proper financing, resources management and oversight of the implementation of the individual projects, the likelihood of successful implementation is significantly reduced implying that the anticipated loss reduction targets will not be met. The RPU is therefore considered an enabling function to implement the projects. The RPU in itself will not reduce losses in a specific area but will ensure that the initiatives targeting losses are properly implemented.

KDM officials have highlighted on various occasions that they view this strategy as vital to ensure success of implementation of the other strategies.

5.5.6.2 Strategy Matrix

			Priority Matrix			
Strategy nr	**Description**	**Category**	Impact	Quick Win	Funding Availability	Technical Capacity
I6	Establishment of Revenue Protection Unit	Institutional	M	M	B	I

5.5.6.3 High level scope

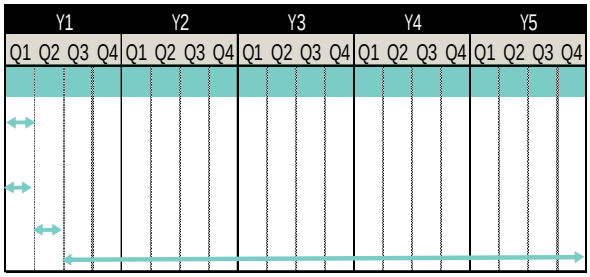
Nr	I6 Establishment of Revenue Protection Unit	
	Scope	Roles & Responsibilities
1	Establish resource requirements & align planned organogram with resource needs	Internal
2	Establish roles & responsibilities by determining strategies to fall under control & management of this unit.	Internal
3	Recruit / transfer(second) staff requirements	Internal
4	Commence with implementation of identified stratgies	Internal

5.5.6.4 Costs Estimation

I6 Establishment of Revenue Protection Unit								R 29,308,046
			Annual Costs					
Human Resources Cost	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
RPU manager	1	R 1,200,000	R 1,200,000	R 1,272,000.00	R 1,348,320.00	R 1,429,219.20	R 1,514,972.35	R 6,764,512
RPU project coordinators	2	R 800,000	R 1,600,000	R 1,696,000.00	R 1,797,760.00	R 1,905,625.60	R 2,019,963.14	R 9,019,349
Analysts	4	R 500,000	R 2,000,000	R 2,120,000.00	R 2,247,200.00	R 2,382,032.00	R 2,524,953.92	R 11,274,186
								R -
TOTAL Human Resources Cost								R 27,058,046

5.5.6.5 SMART implementation schedules

I6 Establishment of Revenue Protection Unit
Establish resource requirements & align planned organogram with resource needs
Establish roles & responsibilities by determining strategies to fall under control & management of this unit.
Recruit / transfer(second) staff requirements
Commence with implementation of identified stratgies



5.5.6.6 Risks & Mitigation measures

Nr	I6 Establishment of Revenue Protection Unit		
	Risk	Impact	Mitigation
1	Budget constraints to fund strategy	Failure to implement strategy	Thorough needs analysis, design and costing for budget pruoses in following financial year procurement
2	Internal skills shortages to perform identified roles & responsibilities	Failure to implement / Sub-standard implementation	Ensure clear role definitions and recruit externally where needed.
3	Non-implementation	Detrimental to other identified strategies	Manage strategies through project steering committee process

5.5.6.7 Procurement & Implementation options

The Revenue Protection Unit is envisaged to be an internal team. Costs for team members will need to be budgeted for. Staffing of Unit may happen through recruitment, transferring of staff from existing resources or a combination thereof.

5.6 Social Intervention & Initiatives

5.6.1 Strategy S1 - Community Engagement

5.6.1.1 Strategy Description

The proposed community engagement strategy is aimed at setting direct and open contact on a programmatic continuous base with affected communities, their leaders, and the authorities to create awareness about the KDM NRE management strategy and management plan. The community engagement strategy includes 3 initiatives, namely, the creation of an awareness campaign, ward-level NRE strategy management through representative forums and a communication channel. The 3 initiatives are outlined below:

A. Establishment of an awareness campaign programme

KDM does not have an awareness campaign aimed at maximising the visibility and the main message of the overall NRE management strategy, therefore an awareness campaign should be established and implemented in KDM. The main purpose of the awareness campaign should be to:

- Inform and educate communities with KDM about electricity supply, consumption, and associated safety precautions; and
- Motivate the communities and influence their attitudes, behaviours, and beliefs towards key electricity related topics viz., payment of electricity bills and illegal electricity connection.

The central message of any awareness raising campaign can be communicated to its intended audience/s using a range of different techniques and approaches viz., newsletters, social media, events and meetings with stakeholders and representatives of the target group to create general awareness on the topic. As part of an awareness campaign to raise awareness about NRE management, non-digital channels should also be considered. (**Figure 1**).

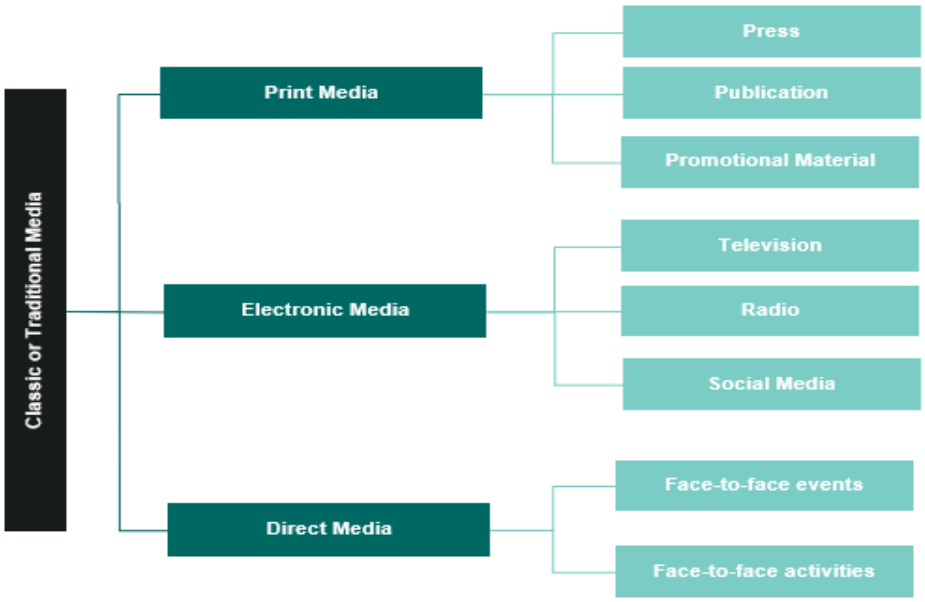


Figure 1:Channels of communication

The benefits of each communication channel are highlighted below:

- Print media

This channel will ensure that the NRE management strategy reaches the general public and decision makers. The channel will use newspapers, magazines, and press releases. Promotional materials such as advertising boards posters and flyers will help in keeping attention on the strategy.

- Direct media

Direct media such as face-to-face events, meetings, trainings, conferences, and word of mouth will constitute a very powerful resource in transferring information about the NRE management strategy. This could include interactive sessions for different subjects relevant for stakeholders.

- Electronic media

This includes collective of online communication channels built on community-based input such as Facebook, Twitter, LinkedIn, WhatsApp, YouTube, content-sharing, and collaboration. These communication channels are based on building a relation with the receiver, and thus can be time-consuming. But, unlike traditional broadcast channels, social media enables people to respond and react to information, making them absolutely engaging. However, a channel not to be set aside in campaigning, leveraging the power of peer-to-peer recommendation should always be word of mouth.

B. Establishment of Ward-level NRE representative Forums

KDM does not have any forums aimed at advocating for the aims and objectives of the NRE management strategy. The KDM has 29 wards, each ward should have a representative forum which is aimed at representing the NRE management strategy at a ward level. The ward representative forums should be:

- Representative of the local Municipal ward, and not politically aligned.
- Aimed at increasing the participation of residents in decision making related to electricity-based initiatives.
- Involved and aware of all electricity related matters as per the integrated development planning process, municipal performance management, annual budget, council projects and other initiatives related to electricity revenue generation; and
- Pro-active and take note of electricity related matters within the ward and assist with implementation of the awareness campaign within the ward.

It is proposed that existing ward structures be utilised as a link between the KDM and the communities within KDM, for the purposes of obtaining information pertaining to electricity supply, consumption, and associated matters. Each ward representative forum should be made up of the ward councillor, ward committee, Community Development Workers (CDWs), and existing community groupings such as business, community-based organisation (CBO), Non-Governmental Organisations (NGOs) and labour Forums. It will be essential to identify groupings and their legitimate representatives, and these will form part of the NRE Forums. The proposed ward structure will ensure that ward-based electricity concerns and issues are raised to respective ward NRE forums.

Additionally, it will ensure that the communities are granted an opportunity to have a say in decision-making, planning and electricity-based initiatives that the council or municipality initiates. This will ensure that ward level impacts are appropriately assessed. **Figure 2** presents the proposed structure of each ward NRE forum, including an overview of the responsibilities of the ward councillor, ward committee and existing community groupings.

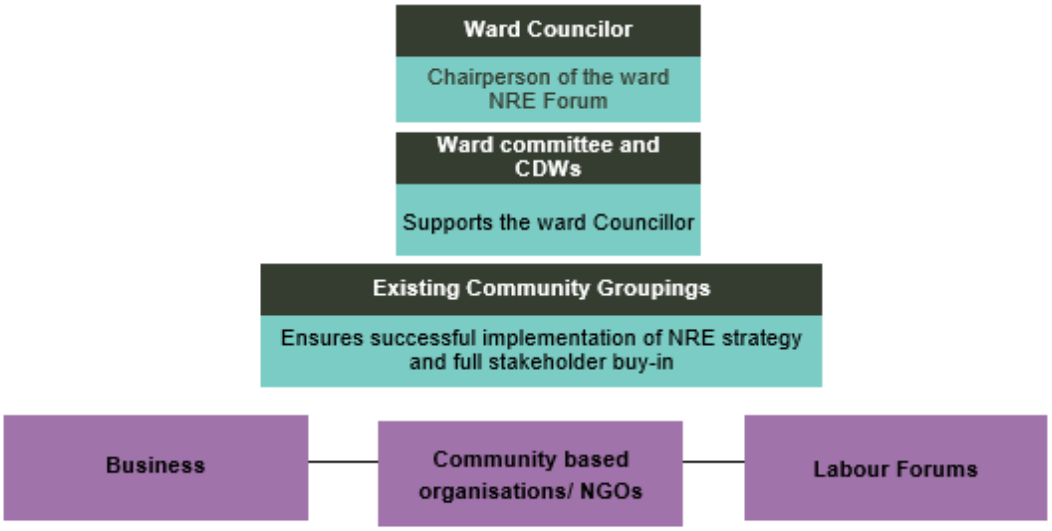


Figure 2: Proposed Structure of the NRE Strategy representative ward forums

C. Establishment of communication channel for public

There is currently no NRE management communication channel in place for the public in KDM to voice their concerns or complaints. The establishment of communication channel will be aimed at providing a system for KDM to receive information and complaints from communities and then disseminate it to the relevant operational units. This will ensure that grievance redress action can be taken quickly. The KDM should set-up a communication channel which will grant communities a platform to:

- Report any observed illegal connections; and
- Report electricity related grievances experienced in the area, including disruption to electricity supply.

In addition,

- Communication through a cost-effective channel could be achieved by KDM email account and WhatsApp line which community members could respectively use to email or text KDM to report issues related to electricity connections and supply[1]; and
- NRE strategy management concerns and suggestion box could be placed at each convenient public places.

Communication channels should link up with the proposed CRM system to ensure proper management of the various communication channels.

5.6.1.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
S1	Community Engagement	Social	M	L	B	I/O

[1] It is recommended that KDM appoints a stakeholder engagement specialist who will be responsible for managing communication from the recommended platforms.

5.6.1.3 High level scope

Nr	S1 Community Engagement	
	Scope	Roles & Responsibilities
1	**Awereness Campaign** Appoint KDM stakeholder engagement specialist Development of comprehensive awareness campaign Implementation of activities Monitoring of activities Evaluation against key indicators	Internal (Engagement Specialist) SP (execution of deliverables)
2	**Ward level NRE strategy representative forums** Development of forum constitution Announcement of establishment of Ward forums Execution of Ward forum activities (meetings etc)	External service provider
3	**Communication channel management** Setting up e-mail & Whatsapp channels Integrate with CRM system Placement of suggestion boxes in public spaces	External service provider

5.6.1.4 Cost Estimation

The cost estimation for this strategy is based on the following assumptions:

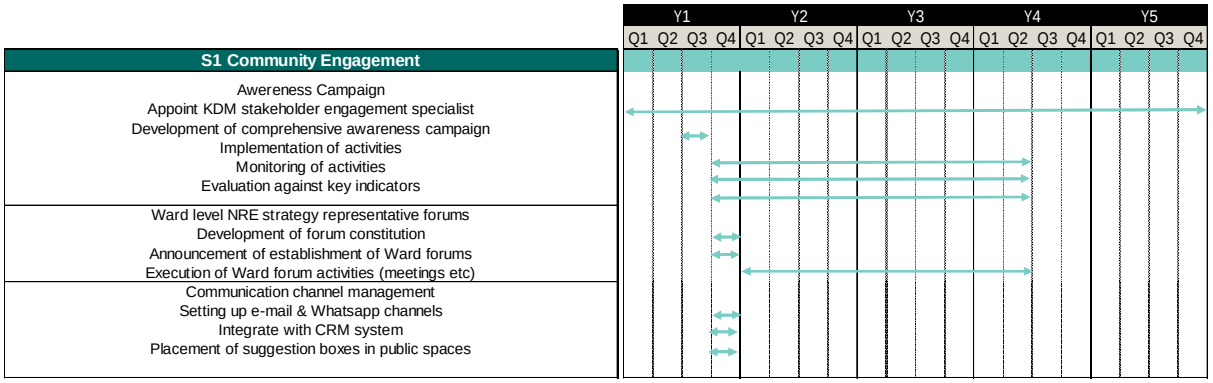
- The appointed KDM stakeholder engagement specialist will be appointed at a rate of R 250 per hour.
- One senior social consultant will work on the conceptualisation of an awareness campaign and develop a campaign awareness strategy.
- Two senior social consultants will work on the implementation of the strategy
- Two senior consultants will work on the monitoring and evaluation of the campaign indicators
- One senior consultant will work on the development of the ward forum constitution
- Two senior consultants will work on the planning and facilitation of forum meetings
- The service provider to place comments and suggestion boxes in the 29 wards within KDM will require 240 hours, with the cost per hour of R3000.00 (which includes the sourcing and supply of the boxes)

The table below provides a summary of the costs associated with this strategy.

S1 Community Engagement								R	4,145,000
			Annual Quantity						
Human Resource	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5		Total cost
Stakeholder Engagement specialist	1	R 528,000	1	1	1	1	1	R	2,640,000
								R	-
TOTAL Stakeholder Engagement specialist								R	2,640,000

			Annual Quantity						
Contractor / Consultant Costs	Qty	Cost/Item	Y1	Y2	Y3	Y4	Y5		Total cost
Conceptualize awareness campaign & develop strategy	1	R 500	160					R	80,000
Implement strategy	2	R 500	200	200	200			R	300,000
Monitor & evaluate campaign	2	R 500	150	150	150			R	225,000
Ward forum constitution development	1	R 500	160					R	80,000
Ward forum meetings planning & facilitation	2	R 500	100	50	50			R	100,000
Placing of comments / suggestion boxes	1	R 3,000	240					R	720,000
TOTAL Other Costs								R	1,505,000

5.6.1.5 SMART implementation schedules



5.6.1.6 Risks & Mitigation measures

Nr	S1 Community Engagement		
	Risk	Impact	Mitigation
1	Unsolved legacy issues - Legacy issues that have not been resolved could potentially lead to an impasse between the municipality and the community.	Unwillingness to participate on the strategy initiatives. Delays in strategy implementation	KDM should disclose all legacy issues that might delay the project
2	Unrealistic community expectations	Social mobilisation viz., community protests	Engage consistently, authentically, and transparently, guided by a clear and sound stakeholder engagement plan
3	Lack of awareness among target audience about the NRE Management strategy and existence of the forum, due to sub-standard planning & implementation at Ward level	Lack of awareness and buy-in about the strategy	Ensure implementation plan contains monitoring and evaluation strategy
4	Exclusion and discouragement due to communication from the public via the communication channels not being atended to.	Community members feeling excluded and discouraged. Diminished buy-in.	Ensure communication fro public as attended to via the CRM system

5.6.1.7 Procurement & Implementation options

The comprehensive conceptualisation and implementation of the community engagement strategy should be outsourced to a qualifying social consulting company, with the on-going support of KDM and respective ward councillors within KDM.

Table below presents the funding options for the proposed initiatives under the community engagement strategy, these funding options can be used to supplement the existing municipal budget.

Potential funder	**Description**
Municipal financial mechanisms (loans and grants)	Funders include government, development finance institutions and donors. Although most mechanisms can fund a range of infrastructure projects, they can be used for specific energy related projects.
Municipal infrastructure grant	The MIG fund is allocated according to a formula to all municipalities that fulfil three categories of conditions: • conformity with the Division of Revenue Act. • cross-cutting conditions (e.g., compliance with the IDP, infrastructure development with economic spin-off for poverty alleviation and job creation, basic service coverage, among others) and • Sector specific conditions.
National Treasury	The fund supports implementation of municipal restructuring or modernisation plans necessary to avoid financial distress and possible risks to the national fiscus.

6 Strategy Summary

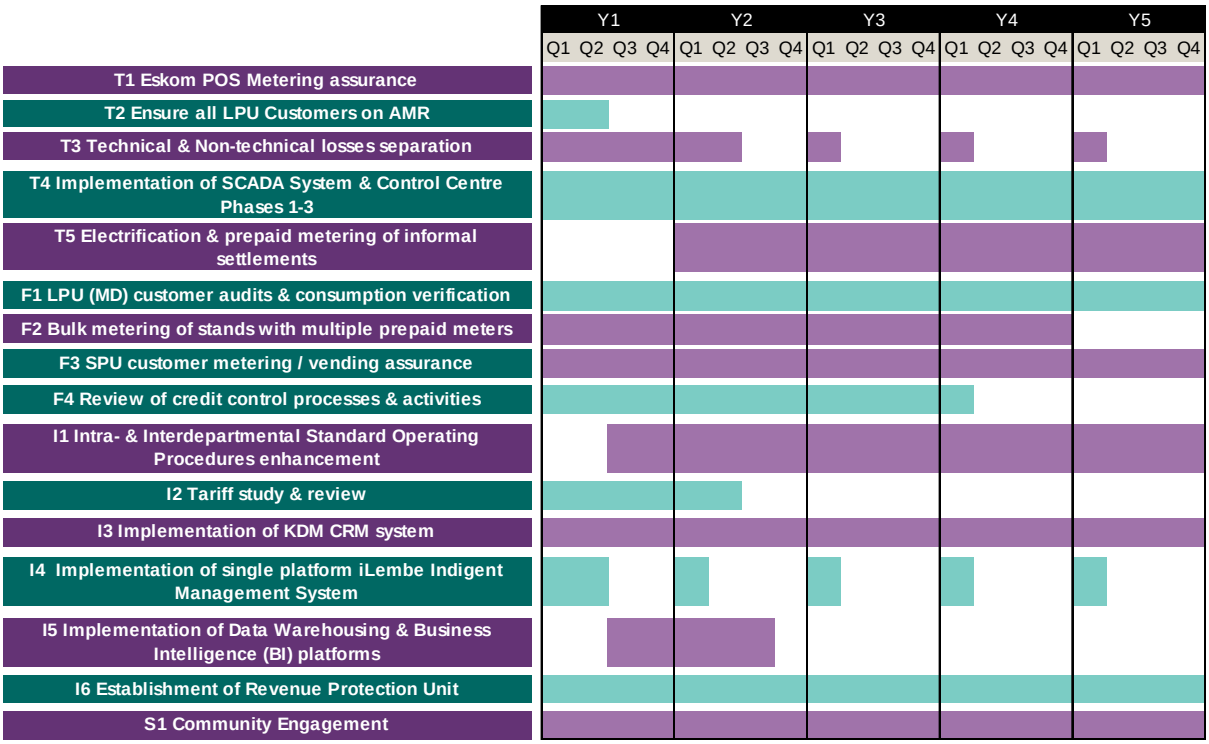
This section aims to provide a holistic overview of the strategies presented in the previous section, highlighting the following aspects.

- Priority Matrix
- Timeline Overview
- Estimated cost summary

6.1 Priority Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
T1	Eskom POS Metering assurance	Technical	L	L	B	O
T2	Ensure all LPU Customers on AMR	Technical	L	L	B	O
T3	Technical & Non-technical losses separation	Technical	L	L	B	I/O
T4	Implementation of SCADA System & Control Centre Phases 1-3	Technical	L	L	B/S	O
T5	Electrification & prepaid metering of informal settlements	Technical	L	L	S	O
F1	LPU (MD) customer audits & consumption verification	Financial	H	H	S	O
F2	Bulk metering of stands with multiple prepaid meters	Financial	M	M	S	O
F3	SPU customer metering / vending assurance	Financial	M	M	B	O
F4	Review of credit control processes & activities	Financial	L	L	B	I/O
I1	Intra- & Interdepartmental Standard Operating Procedures enhancement	Institutional	L	L	B	I/O
I2	Tariff study & review	Institutional	L	L	B	O
I3	Implementation of KDM CRM system	Institutional	L	L	B	O
I4	Implementation of single platform iLembe Indigent Management System	Institutional	L	L	B	O
I5	Implementation of Data Warehousing & Business Intelligence (BI) platforms	Institutional	M	L	S	O
I6	Establishment of Revenue Protection Unit	Institutional	M	M	B/S	I
S1	Community Engagement	Social	M	L	B	I/O

6.2 Timeline Overview



6.3 Costs Summary

Project	Reference	Budgeted / To be Sourced / Vuthela	Cost
T1 Eskom POS Metering assurance	5.3.1.4	B	R 1,311,000
T2 Ensure all LPU Customers on AMR	5.3.2.4	B	R 3,540,750
T3 Technical & Non-technical losses separation	5.3.3.4	B	R 3,374,000
T4 Implementation of SCADA System & Control Centre Phases 1-3	5.3.4.4	B/S	R 50,247,591
T5 Electrification & prepaid metering of informal settlements	5.3.5.4	S	R 9,682,133
F1 LPU (MD) customer audits & consumption verification	5.4.1.4	S	R 822,650
F2 Bulk metering of stands with multiple prepaid meters	5.4.2.4	S	R 476,050
F3 SPU customer metering / vending assurance	5.4.3.4	B	R 18,653,500
F4 Review of credit control processes & activities	5.4.4.4	B	R 2,908,895
I1 Intra- & Interdepartmental Standard Operating Procedures enhancement	5.5.1.4	B	R 420,000
I2 Tariff study & review	5.5.2.4	B	R 780,000
I3 Implementation of KDM CRM system	5.5.3.4	B	R 675,000
I4 Implementation of single platform iLembe Indigent Management System	5.5.4.4	B	R 3,052,174
I5 Implementation of Data Warehousing & Business Intelligence (BI) platforms	5.5.5.4	S	R 5,625,000
I6 Establishment of Revenue Protection Unit	5.5.6.4	B/S	R 29,308,046
S1 Community Engagement	5.6.1.4	B	R 4,145,000
Totals			R 135,021,789

Note:

The budget for T4 SCADA has an allocated budget of R21, 897,592.00 for phase 1 with additional budget requirements for future phases.

For a detailed breakdown of each cost item over years and per item, please see reference number in document.