DELIVERABLE 4:

MANAGEMENT PLAN – MANDENI LOCAL MUNICIPALITY (MLM)

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 Mandeni Local Municipality (MLM).

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: - Composition - Age - Quality - Network modelling	Need for routine maintenance identified
			6.6 kV equipment to be replaced with 11 kV equipment
	1.3.A	Undertake general assessment of Metering & Meter Reading for bulk purchases	No check meters to verify accuracy of Eskom billing
			Tariff structure for Mandeni POS to be queried with Eskom.
			Middle of the month to middle of the month billing may lead to administrative errors.
			Total losses generally very low at less than 4%.
			Umgeni Water POS to be excluded from losses calculations as it skews the picture
	1.3.B	Undertake general assessment of Metering & Meter Reading for Large Power Use (LPU) customers	Only Umgeni Water LPU customer with a three-party agreement between Umgeni Water, MLM and Eskom Wheeling agreement between MLM and Umgeni Water of 10% markup on Eskom billing.
	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 identified for a General Machine Regulations 2(1) responsible person. - Need identified for updated structure consisting of three streams (Municipal Buildings/Reticulation System/Street Lighting)
			<u>Billing & Revenue</u> - Billing & meter reading staff complement of 8. - Credit control staff complement of 4 - No vacancies were identified
	1.5	Assess adequacy & currency of: - By-laws - Policies - Tariff setting - Asset Management planning - Budget for maintenance & planning	<u>By-laws & policies</u> - greater extent are in place - periodic review required to meet current needs
			<u>Tariff setting</u> - No tariff study in recent years may indicate that current tariffs may not be cost reflective
			<u>Asset Management & Planning</u> - Relatively low asset management practice maturity - Related to skill challenge & budget constraints - Vuthela LED IMQS Asset Management Plan (AMP) is high level with aim to steer MLM towards quality AM planning

			Budgets for Operations & Maintenance - Budgets of approximately R 3.3m per financial year 2022/23; 2023/24 and 2024/25. - Value approximately 6% of total budgeted costs
	1.7	Assess Technical Management Information System	Systems Identified: - ESRI ArcGIS for spatial planning & development - Sage Evolution for financial management & billing (mSCOA compliant) - Conlog for prepaid electricity vending - PayDay software for payroll - Microsoft Excel, Projects, Teams etc - AMS360 asset management software
			Gaps Identified: - SCADA (Supervisory Control & Data Acquisition) - No current functionality in MLM - Solution roadmap presented in separate study, but recommendations not yet implemented

Main Category	Number	Sub-category	Assessment Findings
2. Technical Losses	**2.1**	Determine energy balance ito: - Quantum of electricity loss - Key elements in grid where losses are occurring - Reasons / causes of losses	One independent assessment conducted as part of 2019 Mandeni Local Municipality Electricity Master Plan (EMP).
			No real separation of technical & non-technical losses in place

Main Category	Number	Sub-category	Assessment Findings
3. Non-technical Losses	**3.1**	Assess completeness & adequacy of metering of electricity - various categories of users	Potential large gap identified between customers having a meter linked to account vs potential customers.
	3.2	Assess adequacy, efficiency of institutional arrangements for meter installations & readings (SOP)	No SOPs in place
	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 (Sage Pastel) is mSCOA compliant
			Supplementary prepaid system (Conlog) STS compliant.
			No AMR system in place, however not required.
			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 - Assess completeness of info on billing system	Refer 3.1

	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
			MLM - Call centre in office of the Municipal Manager
	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	Gaps in billing identified resulting from indications that not all electricity meters are in system
	3.7	Investigate necessity of tariff study & review	No tariff study has been done in recent times
			A tariff study and review are recommended.
	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 - Percentage debt outstanding >	81% of debtors book 180 days or older
			Umgeni water biggest debtor but stay current with payments

		90 days - Review credit control measures - Follow up of existing payment arrangements in place - Councillor involvement in debtor management	Top 25 debtors almost all government institutions (provincial & national)

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	No current campaigns / processes exist to educate community on importance of paying for services and danger / consequences of electricity theft.
	4.2	Take into consideration community awareness re dangers & impact of electricity theft against issues such as poverty & inequality	

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 13 strategies consisting of:

- 3 x Technical
- 4 x Financial
- 5 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	3	L	L	S	O
T2	Technical & Non-technical losses seperation	Technical	4	L	L	S	I/O
T3	Upgrade of 6.6kV networks to 11kV	Technical	5	L	L	S	O
F1	Eskom billing administration	Financial	1	H	H	B	I
F2	Prepaid customer vending assurance	Financial	1	M	M	B	O
F3	Conventional customer billing assurance	Financial	1	M	L	B	O
F4	Review of credit control processes & activities	Financial	5	L	L	B	I / O
I1	Intra- & Interdepartmental Standard Operating Procedures	Institutional	3	M	M	B	O / I
I2	Tariff study & review	Institutional	2	L	L	S	O
I3	Implementation of single platform iLembe Indigent Management System	Institutional	5	L	L	V	O
I4	Implementation of Data Warehousing & Business Intelligence Platform	Institutional	2	M	L	S	O
I5	Independent review of NERSA D forms	Institutional	4	L	L	S	O
S1	Community Engagement	Social	4	M	L	B	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 was 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	**Mandeni Intake** Reinstate existing vandalised check meter installation Download metering data on monthly basis & compare with Eskom billing data.	R 40,000
	T2	Technical & Non-technical losses separation	Develop SLD of MLM network at MV and MV/LV distribution level	R 702,000
			Conduct technical loss study – Base. The required metering data can be captured with portable meters during peak periods and captured into spreadsheets custom-designed for this purpose. The LV network loss component to be a sample network representative of the MLM system.	
			Technical Loss Study Update	
			Develop losses separation methodology	
			Annual Losses Separation	
	T3	Upgrade of 6.6kV networks to 11kV	Planning and Design Phase for the replacement of 6.6kV networks to 11kV	R 18,200,000
			Phased project implementation	

Strategy Category	Number	Strategy Description	High level scope	Cost Estimation
2. Financial Strategies	F1	Eskom billing administration	Query Tariff structure for Mandeni intake point with Eskom for explanation	R -
			Arrange for full calendar billing month as opposed to middle of the month billing.	
			Monthly analysis of Eskom billing for anomalies.	
	F2	Prepaid customer vending assurance	Data clean-up and mirroring of Sage Pastel financial system and Conlog Prepaid system information	R 500,000
			Flagging of Eskom supplied stands in financial system	
			Auditing of non-Eskom supplied stands with no record of a meter	
			Auditing of meters showing no purchasing for more than 90 days	
			Monthly ongoing data analysis of purchasing history, auditing of meters with no purchases for 90 days.	
			Targeted audits of areas where 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	
	F3	Conventional customer billing assurance	Auditing of non-Eskom supplied stands with no record of a meter	R 475,000
			Auditing of meters being estimated	
			Inspections of meters appearing on the faulty meters list & appropriate remedial action	
			Consumer awareness campaign to submit meter readings	
			Appointment of external Meter Reading Contracting company to read conventional meters	

			Inspections of meters appearing on the faulty meters list & appropriate remedial action	
	F4	Review of credit control processes & activities	Outsource Management of Credit control activities	R 1,537,200
			Introduce digital mobile technology for activities execution and quality control	
			Manage processes through proposed Data & Workforce Management system	

Strategy Category	Number	Strategy Description	High level scope	Cost Estimation
3. Institutional Strategies	**I1**	Intra- & Interdepartmental Standard Operating Procedures	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	Draw up tender document with defined scope and deliverables	R 780,000
			Appoint Service provider	
			Service provider conducts study and review and provide report with practice recommendations. Specific emphasis on review of Umgeni wheeling agreement and possible change to appropriate tariff structure	
	I3	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	

	I4	Implementation of Data Warehousing & Business Intelligence Platform	**<u>Data Warehousing</u>** Establish needs & Design system Determine cost & budget accordingly Procure system addressing specific needs Implementation & training	R	3,375,000
			<u>Business Intelligence</u> Establish needs & Design system Determine cost & budget accordingly Procure system that addresses needs Implementation & training		
	I5	Independent review of NERSA D forms	Review of D forms for past 3 years	R	210,000
			Assistance with compilation of D forms for FY 2022		
			Skills transfer to internal resource(s)		

Strategy Category	Number	Strategy Description	High level scope	Cost Estimation	
4. Social Intervention & Initiatives Strategy	**S1**	Community Engagement	Appoint qualified Client Liaison Officer	R	3,410,000
			<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)		

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

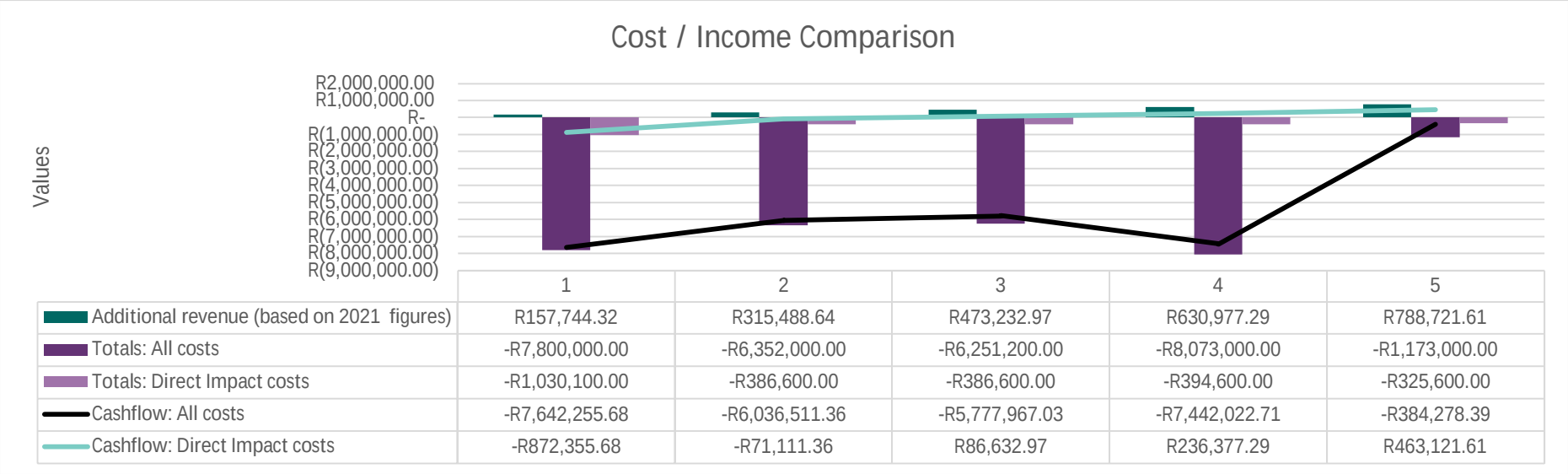
This section provides an overview of the estimated costs per strategy over the next five years.

It also provides a comparison between costs and projected reduction of losses and accompanying improved revenue of 1% per financial year for the next five years to reduce total losses from 8.47% (2021 figures) to 3.47%. These projections are based on the NERSA D forms information of 2021.

If all costs are included in the cost-benefit calculation, then MLM will need reap any benefit over a five-year period. The picture however looks quite different if costs on strategies not directly impacting non-revenue energy are excluded with a positive ROI from year three.

Projected Loss Reduction & Revenue Improvement	Y1	Y2	Y3	Y4	Y5	**Totals All Costs**
Annual loss reduction percentage	1%	1%	1%	1%	1%	5%
Total losses percentage	7.47%	6.47%	5.47%	4.47%	3.47%	3.47%
Additional kWH electricity sales (based on 2021 figures)	93,750	187,501	281,251	375,001	468,752	1,406,255
Additional revenue (based on 2021 figures)	R157,744	R315,489	R473,233	R630,977	R788,722	R2,366,165

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	0%	R40,000.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R40,000.00	*R0.00*
T2 Technical & Non-technical losses seperation	0%	R462,000.00	*R0.00*	R60,000.00	*R0.00*	R60,000.00	*R0.00*	R60,000.00	*R0.00*	R60,000.00	*R0.00*	R702,000.00	*R0.00*
T3 Upgrade of 6.6kV networks to 11kV	1%	R2,100,000.00	*R21,000.00*	R4,600,000.00	*R46,000.00*	R4,600,000.00	*R46,000.00*	R6,900,000.00	*R69,000.00*	R0.00	*R0.00*	R18,200,000.00	*R182,000.00*
F1 Eskom billing administration	1%	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*
F2 Prepaid customer vending assurance	70%	R340,000.00	*R238,000.00*	R40,000.00	*R28,000.00*	R40,000.00	*R28,000.00*	R40,000.00	*R28,000.00*	R40,000.00	*R28,000.00*	R500,000.00	*R350,000.00*
F3 Conventional customer billing assurance	60%	R95,000.00	*R57,000.00*	R95,000.00	*R57,000.00*	R95,000.00	*R57,000.00*	R95,000.00	*R57,000.00*	R95,000.00	*R57,000.00*	R475,000.00	*R285,000.00*
F4 Review of credit control processes & activities	0%	R630,000.00	*R0.00*	R504,000.00	*R0.00*	R403,200.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R1,537,200.00	*R0.00*
I1 Intra- & Interdepartmental Standard Operating Procedures	1%	R420,000.00	*R4,200.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R420,000.00	*R4,200.00*
I2 Tariff study & review	1%	R780,000.00	*R7,800.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R780,000.00	*R7,800.00*
I3 Implementation of single platform iLembe Indigent Management System	1%	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*
I4 Implementation of Data Warehousing & Business Intelligence Platform	30%	R1,575,000.00	*R472,500.00*	R450,000.00	*R135,000.00*	R450,000.00	*R135,000.00*	R450,000.00	*R135,000.00*	R450,000.00	*R135,000.00*	R3,375,000.00	*R1,012,500.00*
I5 Independent review of NERSA D forms	0%	R210,000.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R0.00	*R0.00*	R210,000.00	*R0.00*
S1 Community Engagement	20%	R1,148,000.00	*R229,600.00*	R603,000.00	*R120,600.00*	R603,000.00	*R120,600.00*	R528,000.00	*R105,600.00*	R528,000.00	*R105,600.00*	R3,410,000.00	*R682,000.00*
Total Costs		-R7,800,000.00	*-R1,030,100.00*	-R6,352,000.00	*-R386,600.00*	-R6,251,200.00	*-R386,600.00*	-R8,073,000.00	*-R394,600.00*	-R1,173,000.00	*-R325,600.00*	-R29,649,200.00	*-R2,523,500.00*
Cashflow		-R7,642,255.68	*-R872,355.68*	-R6,036,511.36	*-R71,111.36*	-R5,777,967.03	*R86,632.97*	-R7,442,022.71	*R236,377.29*	-R384,278.39	*R463,121.61*	-R27,283,035.17	-R157,335.17
Return on Investment (ROI)		2.02%	*15.31%*	4.97%	*81.61%*	7.57%	*122.41%*	7.82%	*159.90%*	67.24%	*242.24%*	7.98%	93.77%



	1	2	3	4	5
Additional revenue (based on 2021 figures)	R157,744.32	R315,488.64	R473,232.97	R630,977.29	R788,721.61
Totals: All costs	-R7,800,000.00	-R6,352,000.00	-R6,251,200.00	-R8,073,000.00	-R1,173,000.00
Totals: Direct Impact costs	-R1,030,100.00	-R386,600.00	-R386,600.00	-R394,600.00	-R325,600.00
Cashflow: All costs	-R7,642,255.68	-R6,036,511.36	-R5,777,967.03	-R7,442,022.71	-R384,278.39
Cashflow: Direct Impact costs	-R872,355.68	-R71,111.36	R86,632.97	R236,377.29	R463,121.61

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 make adjustments where necessary.

Projected Loss Reduction vs Actual	Y1	Y2	Y3	Y4	Y5
Total losses percentage projected	7.47%	6.47%	5.47%	4.47%	3.47%
Total losses percentage actual	8.00%	0.00%	0.00%	0.00%	0.00%
Variance	-0.53%	6.47%	5.47%	4.47%	3.47%

Strategies Annual Estimated Costs vs Actual Costs	Y1	Y2	Y3	Y4	Y5	Totals
Total Estimated Total Costs	**R 8,830,100.00**	**R 6,738,600.00**	**R 6,637,800.00**	**R 8,467,600.00**	**R 1,498,600.00**	**R 32,172,700.00**
Total Actual Costs	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
Variance	**R 8,830,100.00**	**R 6,738,600.00**	**R 6,637,800.00**	**R 8,467,600.00**	**R 1,498,600.00**	**R 32,172,700.00**

ANNEXURE A – Roadmap Schedule

ZUTARI
IMPACT. ENGINEERED.

1001750 MLM

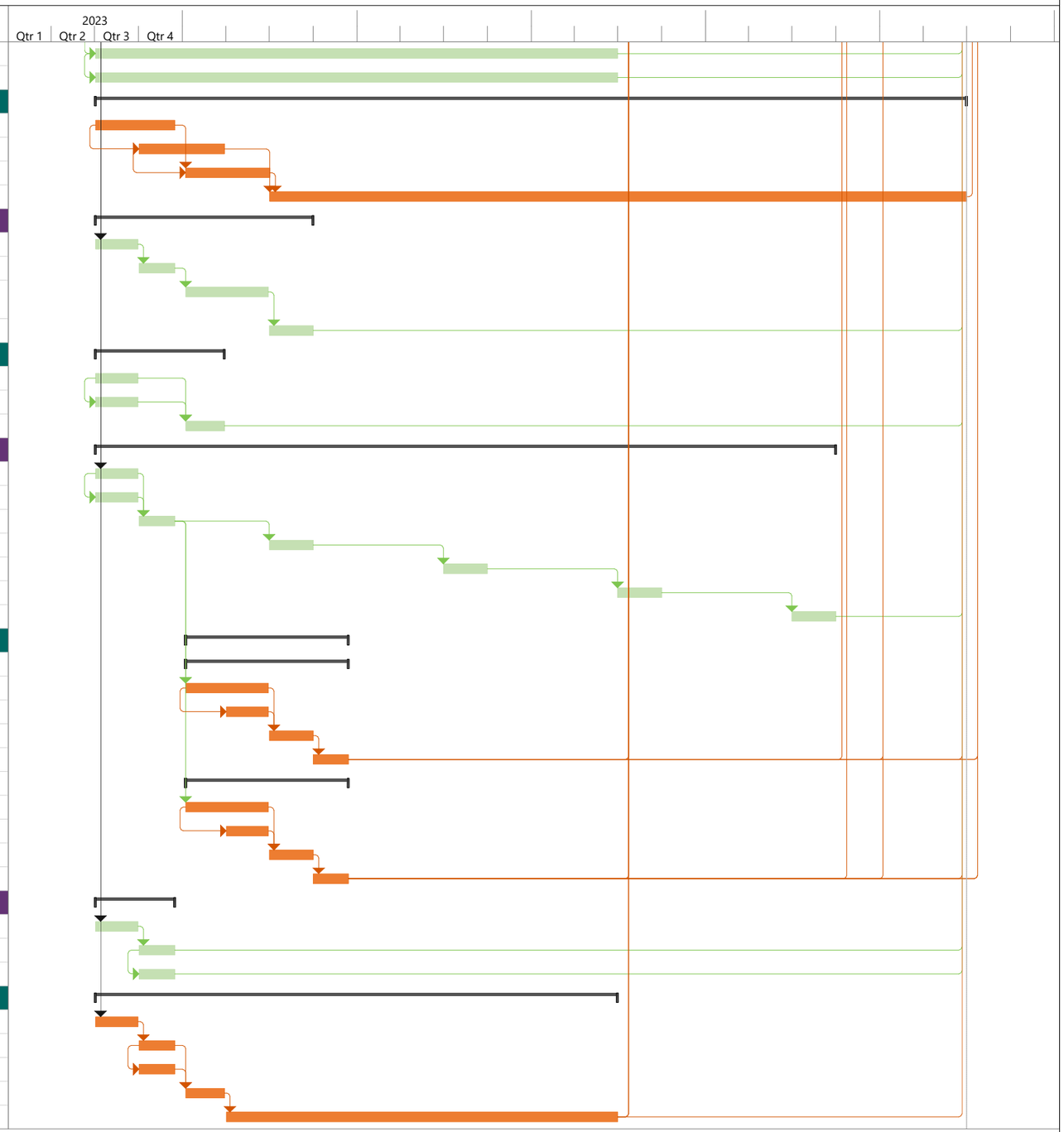
ID	Task Name	Start	Finish
1	**KDM - MLM**	**01 Jul '23**	**30 Jun '28**
2	**Milestones**	**01 Jul '23**	**30 Jun '28**
3	Project start	01 Jul '23	01 Jul '23
4	Project finish	30 Jun '28	30 Jun '28
5	**T1 Eskom POS Metering assurance**	**03 Jul '23**	**30 Jun '28**
6	Mandeni Intake	03 Jul '23	02 Oct '23
7	Reinstate existing vandalised check meter installation	03 Jul '23	29 Sep '23
8	Download metering data on monthly basis & compare with Eskom billing data.	03 Oct '23	30 Jun '28
9	**T2 Technical & Non-technical losses seperation**	**03 Jul '23**	**30 Sep '27**
10	Develop SLD of MLM network at MV and MV/LV distribution level	03 Jul '23	29 Sep '23
11	Conduct technical loss study – Base. The required metering data can be captured with portable meters during peak periods and captured into spreadsheets custom-designed for this purpose. The LV network loss component to be a sample network representative o	02 Oct '23	28 Mar '24
12	Technical Loss Study Update	01 Jul '27	20 Sep '27
13	Develop losses separation methodology	02 Apr '24	28 Jun '24
14	Annual Losses Separation	01 Jul '24	30 Sep '24
15	Annual Losses Separation	01 Jul '25	30 Sep '25
16	Annual Losses Separation	01 Jul '26	30 Sep '26
17	Annual Losses Separation	01 Jul '27	30 Sep '27
18	**T3 Upgrade of 6.6kV networks to 11kV**	**03 Jul '23**	**30 Jun '27**
19	Planning and Design Phase for the replacement of 6.6kV networks to 11kV	03 Jul '23	28 Jun '24
20	Phased project implementation	01 Jul '24	30 Jun '27
21	**F1 Eskom billing administration**	**03 Jul '23**	**30 Jun '28**
22	Query Tariff structure for Mandeni intake point with Eskom for explanation	03 Jul '23	29 Sep '23
23	Arrange for full calendar billing month as opposed to middle of the month billing.	03 Jul '23	29 Sep '23
24	Monthly analysis of Eskom billing for anomalies.	02 Oct '23	30 Jun '28
25	**F2 Prepaid customer vending assurance**	**03 Jul '23**	**30 Jun '28**
26	Data clean-up and mirroring of Sage Pastel financial system and Conlog Prepaid system information	03 Jul '23	29 Sep '23
27	Flagging of Eskom supplied stands in Financial system	03 Jul '23	29 Sep '23
28	Auditing of non-Eskom supplied stands with no record of a meter	02 Oct '23	28 Mar '24
29	Auditing of meters showing no purchasing for more than 90 days	02 Oct '23	28 Jun '24
30	Monthly ongoing data analysis of purchasing history, auditing of meters with no purchases for 90 days.	01 Jul '24	30 Jun '28
31	Targeted audits of areas where meters show purchases lower than the expected benchmark for the specific area	01 Jul '24	13 Dec '24
32	Targeted audits of areas where meters show purchases lower than the expected benchmark for the specific area	01 Jul '25	15 Dec '25
33	Targeted audits of areas where meters show purchases lower than the expected benchmark for the specific area	01 Jul '26	15 Dec '26
34	Targeted audits of areas where meters show purchases lower than the expected benchmark for the specific area	01 Jul '27	15 Dec '27
35	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
36	**F3 Conventional customer billing assurance**	**03 Jul '23**	**30 Jun '26**
37	Auditing of non-Eskom supplied stands with no record of a meter	03 Jul '23	28 Mar '24
38	Auditing of meters being estimated	03 Jul '23	28 Jun '24
39	Inspections of meters appearing on the faulty meters list & appropriate remedial action	03 Jul '23	30 Jun '26
40	Consumer awareness campaign to submit meter readings	03 Jul '23	30 Jun '26
41	**F4 Review of credit control processes & activities**	**03 Jul '23**	**30 Jun '26**
42	Outsource Management of Credit control activities	03 Jul '23	30 Jun '26

Low impact
Medium Impact
High Impact

ZUTARI
IMPACT. ENGINEERED.

1001750 MLM

ID	Task Name	Start	Finish
43	Introduce digital mobile technlogy for activities execution and quality control	03 Jul '23	30 Jun '26
44	Manage processes through proposed Data & Workforce Management system	03 Jul '23	30 Jun '26
45	**I1 Intra- & Interdepartmental Standard Operating Procedures**	**03 Jul '23**	**30 Jun '28**
46	Draw process flow type SOP for each work process	03 Jul '23	15 Dec '23
47	Develop SLA & incorporate process flows into document	02 Oct '23	28 Mar '24
48	Develop KPI's based on SLA	08 Jan '24	01 Jul '24
49	Manage performance accordingly	02 Jul '24	30 Jun '28
50	**I2 Tariff study & review**	**03 Jul '23**	**30 Sep '24**
51	Draw up tender document with defined scope and deliverables	03 Jul '23	29 Sep '23
52	Appoint Service provider	02 Oct '23	15 Dec '23
53	Service provider conducts study and review and provide report with practice recommendations. Specific emphasis on review of Umgeni wheeling agreement and possible change to appropriate tariff structure	08 Jan '24	28 Jun '24
54	Implement recommended practices	01 Jul '24	30 Sep '24
55	**Implementation of single platform iLembe Indigent Management System**	**03 Jul '23**	**28 Mar '24**
56	Implement small scale customer call centre	03 Jul '23	29 Sep '23
57	Implement communication channels as per S1	03 Jul '23	29 Sep '23
58	Merge into regional Customer care centre & CRM system when available	08 Jan '24	28 Mar '24
59	**I3 Implementation of single platform iLembe Indigent Management System**	**03 Jul '23**	**30 Sep '27**
60	Drawing up of ToR for role stakeholder input.	03 Jul '23	29 Sep '23
61	Signing of MOA	03 Jul '23	29 Sep '23
62	Procure & Implement IS system	02 Oct '23	15 Dec '23
63	Annual review of register	01 Jul '24	30 Sep '24
64	Annual review of register	01 Jul '25	30 Sep '25
65	Annual review of register	01 Jul '26	30 Sep '26
66	Annual review of register	01 Jul '27	30 Sep '27
67	**I4 Implementation of Data Warehousing & Business Intelligence Platform**	**08 Jan '24**	**13 Dec '24**
68	**Data Warehousing**	**08 Jan '24**	**13 Dec '24**
69	Establish needs & Design system	08 Jan '24	28 Jun '24
70	Determine cost & budget accordingly	02 Apr '24	28 Jun '24
71	Procure system adressing specific needs	01 Jul '24	30 Sep '24
72	Implementation & training	01 Oct '24	13 Dec '24
73	**Business Intelligence Establish**	**08 Jan '24**	**13 Dec '24**
74	Establish needs & Design system	08 Jan '24	28 Jun '24
75	Determine cost & budget accordingly	02 Apr '24	28 Jun '24
76	Procure system adressing specific needs	01 Jul '24	30 Sep '24
77	Implementation & training	01 Oct '24	13 Dec '24
78	**I5 Independent review of NERSA D forms**	**03 Jul '23**	**15 Dec '23**
79	Review of D forms for past 3 years	03 Jul '23	29 Sep '23
80	Assistance with compilation of D forms for FY 2022	02 Oct '23	15 Dec '23
81	Skills transfer to internal resource(s)	02 Oct '23	15 Dec '23
82	**S1 Community Engagement**	**03 Jul '23**	**30 Jun '26**
83	Appoint qualified Client Liaison Officer	03 Jul '23	29 Sep '23
84	Ward level NRE strategy representative forums	02 Oct '23	15 Dec '23
85	Development of forum constitution	02 Oct '23	15 Dec '23
86	Announcement of establishment of Ward forums	08 Jan '24	28 Mar '24
87	Execution of Ward forum activities (meetings etc)	02 Apr '24	30 Jun '26



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	

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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:

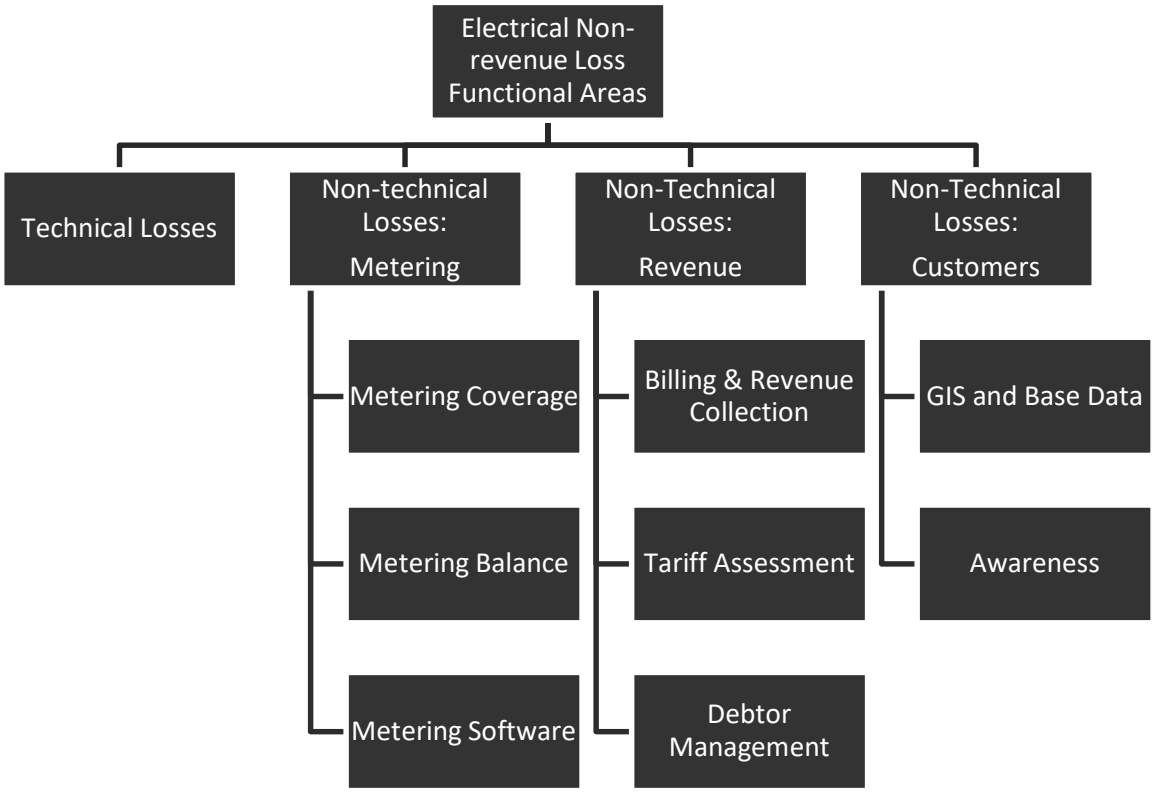


Figure 2: Non-Revenue management functional WBS

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.

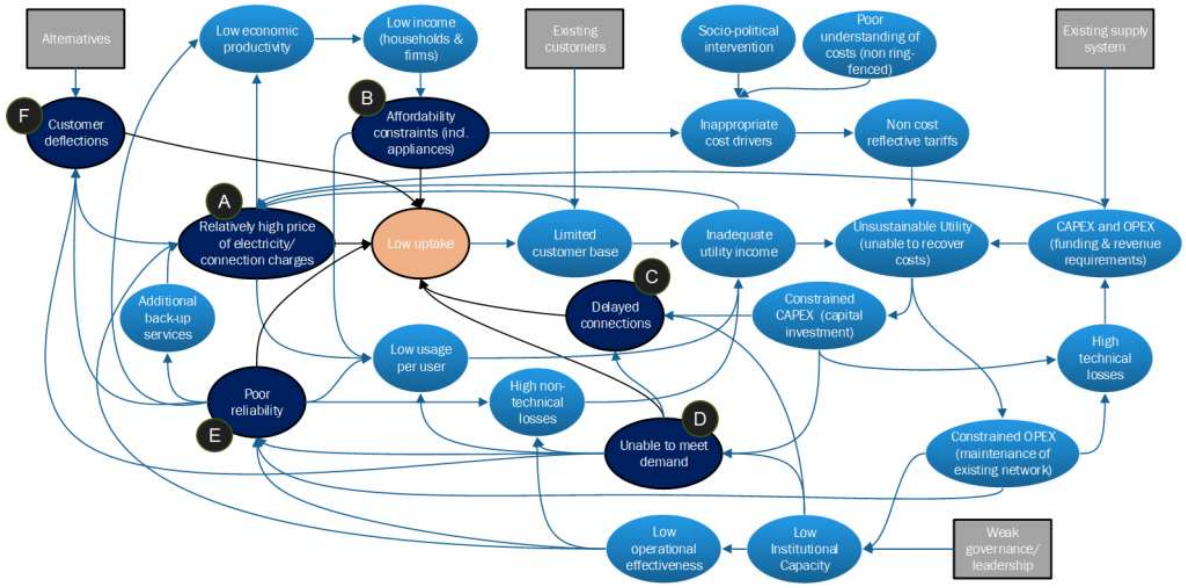


Figure 3; Causal Loop Diagram example

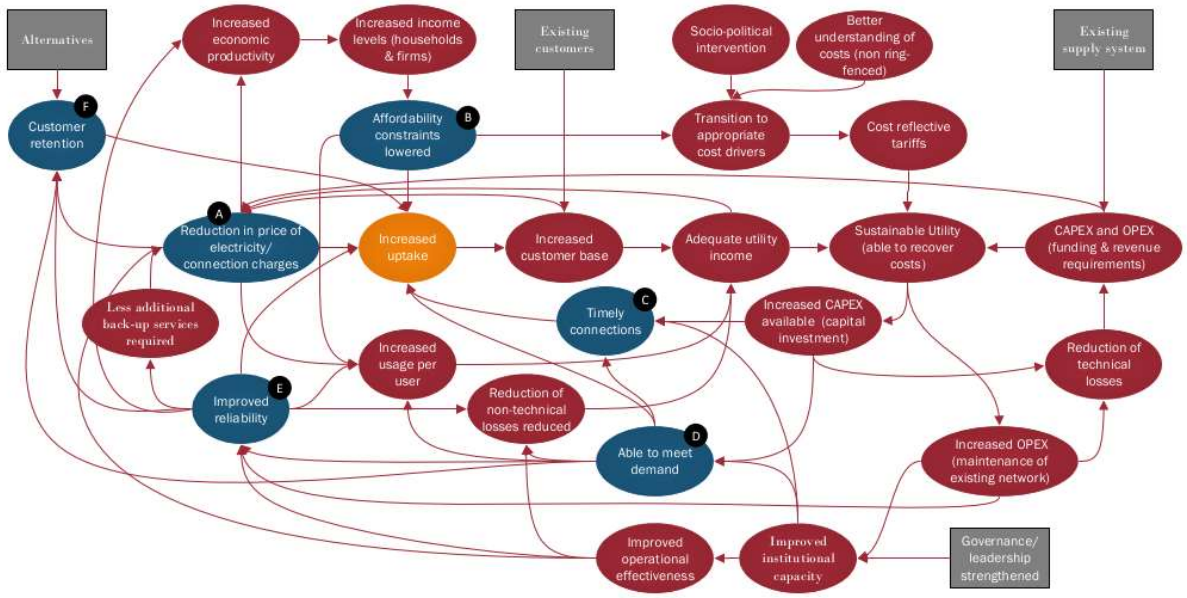


Figure 4: Results framework example

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

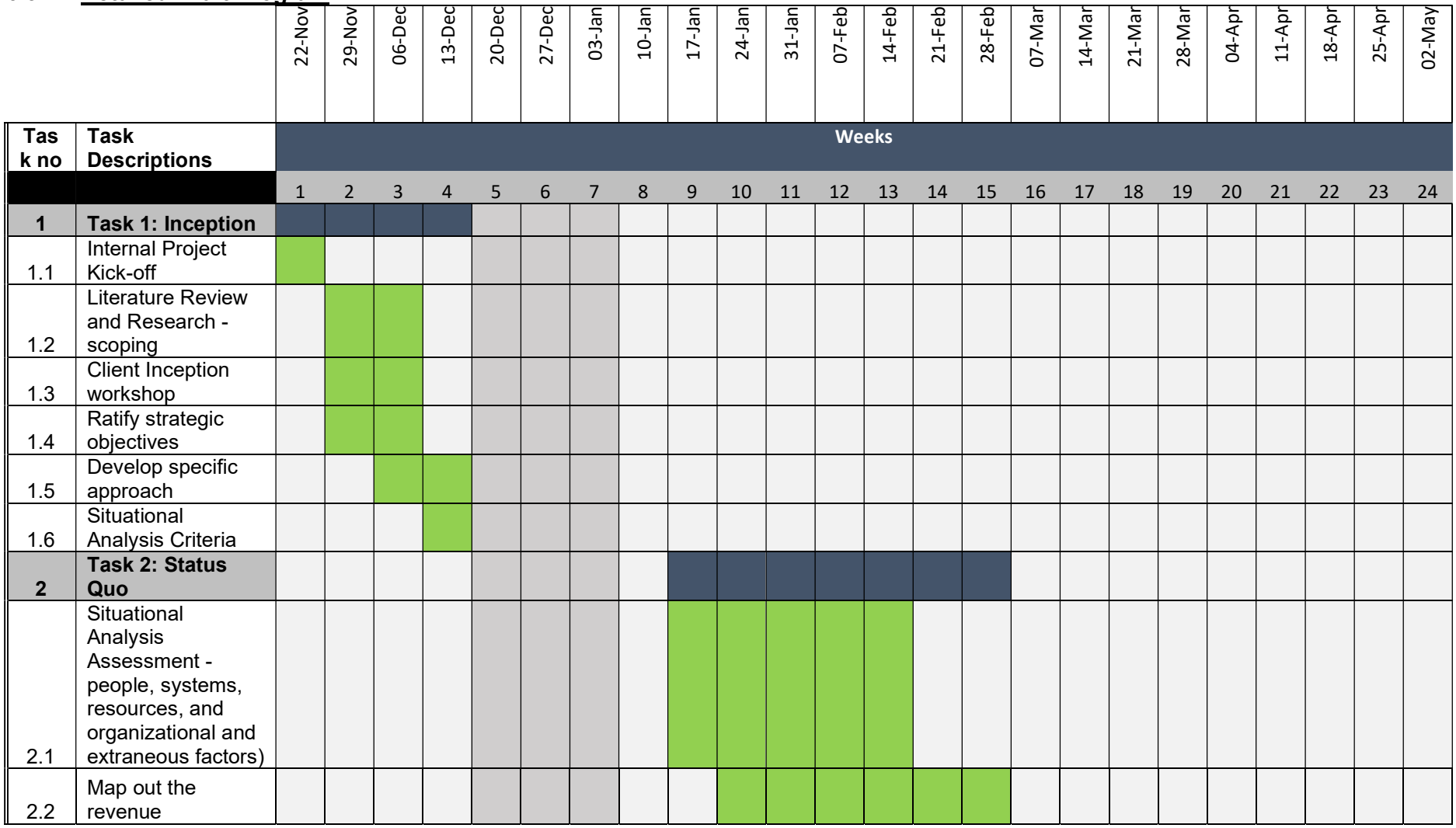
This section provides the project programme of the contract, illustrating the main tasks and timeframes to complete the tasks as well as agreed costing. Table 6 Provides a summary of tasks, completion dates, milestone indicators and costing.

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



	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	Date:	13 October 2021
Telephone:	012-424-9707	Your Ref:	
Email:	sandram@mariswe.com	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

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

KWADUKUZA MUNICIPALITY

Vuthela
ILEMBE LED PROGRAMME

ZUTARI
IMPACT. ENGINEERED.

STATUS QUO REPORT – MANDENI LOCAL MUNICIPALITY (MLM)

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

Contract No.: VILP/I/033

Date: 20/07/2022

Version 3

Prepared By:

Leon Prinsloo	
Prasun Seebran	
Martin Piper	

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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
FBE	Free Basic Electricity
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
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
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 Mandeni Local Municipality (MLM).

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 MLM, a workshop was held on the 24th of February 2022 with 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
Senzo Makhoba	MLM	Finance	Senzo.makhoba@mandeni.gov.za
Munya Mutyora	Vuthela	Infrastructure	munyam@vuthelaled.co.za
Selby Msweli	MLM	Electrical	selbym@mandeni.gov.za
Zama Soji	Vuthela	Infrastructure	Szamas@vuthelaled.co.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:

- 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 3.

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.

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 information systems in place in the municipality to manage, operate and maintain the electrical service network."

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

Main Deliverable	Number	Assessment Item	Reference Material	Source
1. Existing Infrastructure Assessment	**1.1**	Confirm & validate key network installations	Previous Assessment reports & initiatives to reduce losses (T)	Any
			Electricity Master Plans (T)	Energy
			As built drawings (T)	Energy
			Fixed asset register (T)	Energy
			Asset Management plan(s) (T)	Any
			MLM draft IDP (T)	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
	1.2	Desktop Study entire electricity network to determine: - Composition - Age - Quality - Network modelling	Previous Assessment reports & initiatives to reduce losses (T)	Any
			Electricity Master Plans (T)	Energy
			As built drawings (T)	Energy
			Fixed asset register (T)	Energy
			Asset Management plan(s) (T)	Energy
			MLM draft IDP (T)	Any
			MLM NERSA D forms (A)	Energy
			Existing network model (Z)	Energy
			Supply areas (Z)	Energy
			Outage statistics (Z)	Energy
	1.3A	Undertake general assessment of Metering & Meter Reading for bulk purchases	ESKOM account & billing data (Z)	Energy
			Detailed POD information (metering diagrams, CT /VT data etc) (Z)	Energy
			POD sub-metering? (Z)	Energy
	1.3B	Undertake general assessment of Metering & Meter Reading for high use customers	High end user list (Z)	Any
			AMR PSP? (Z)	Energy
			AMR data (Z)	Any
			AMR fault list (Z)	Energy
	1.4	Assess existing roles & responsibilities & effectiveness of: - Provision of electrical services in general - Meter readings - Revenue collections	Department organograms? (Z)	Any
			Vacancies? (Z)	Any
			Meter reading outsourced / internal? (Z)	Finance
			Credit control outsourced / internal? (Z)	Finance

		- Operations & maintenance of electricity services in general	Ops & maintenance team composition (Z)	Energy
	1.5	Assess adequacy & currency of: - By-laws - Policies - Tariff setting - Asset Management planning - Budget for maintenance & planning	Electricity by-laws (Z)	Energy
			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
	1.6A	Assess Study for Asset Management Information System	Any assessment studies?	Any
			applicable procedures (Z)	Any
			AM system information (Z)	Any
	1.6B	Assess Functional Design & Specification for SCADA System & Control room	Vuthela functional design & specification for SCADA system & Control room (T)	Vuthela
			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, consist of:

- Electricity Master Plans
- Network Drawings
- IDP 2021/22

The Mandeni Municipality has two licensed electricity distributors, namely Eskom and Mandeni. Mandeni has no generation capacity and buys their electricity from Eskom and resells to customers within their licensed area which is the range of 1000 customers. The majority of the municipality is supplied by Eskom as per Figure 1 which indicates the extent of the municipal supply area in comparison to the municipal boundary.

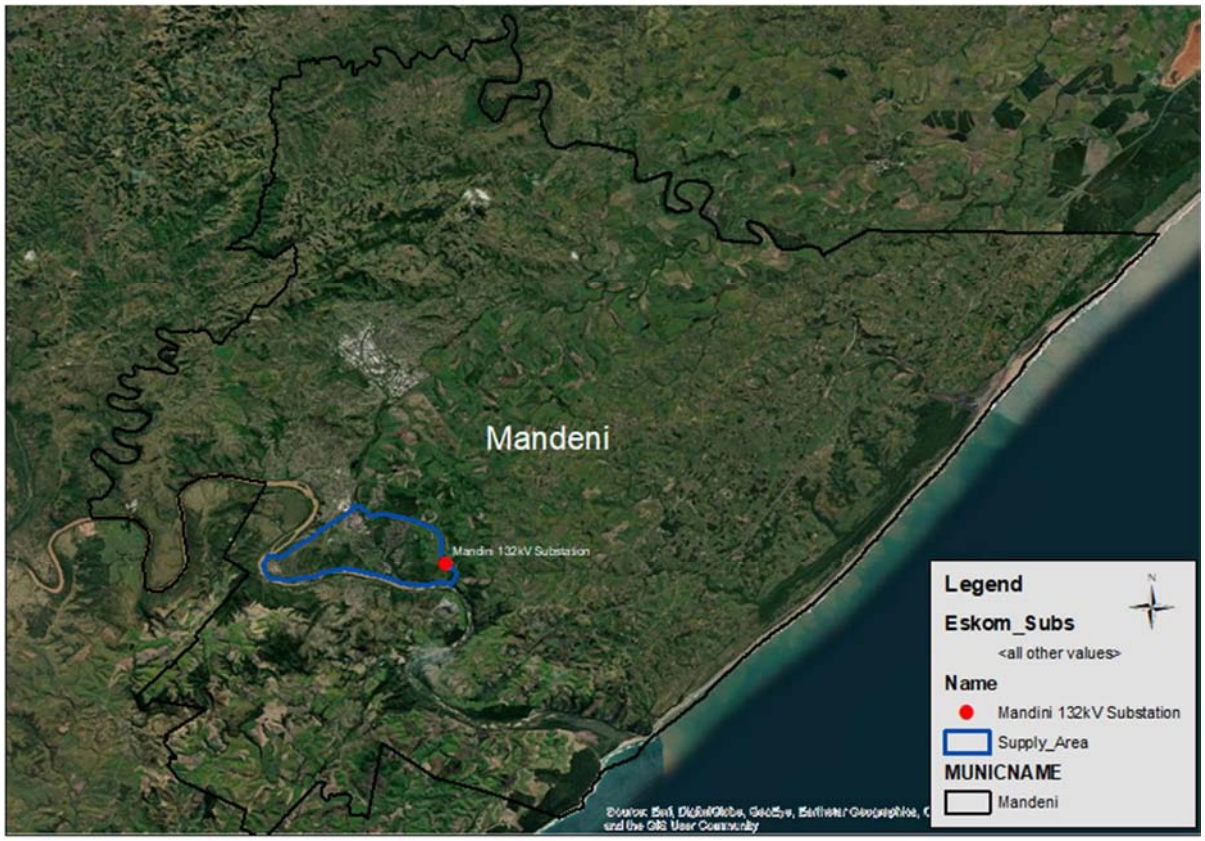


Figure 1: ***Supply Boundaries & Eskom substations***

4.1.3.1.1 Bulk Supply System

The electrical network hierachy for MLM is shown in Figure 2 overleaf. The bulk supply at the highest level is Mandini 132kV / 88 /11 kV Main Transmission Substation. There is one independent 11kV supply from the Eskom Mandeni substation via an 11kV overhead line. The Point of Supply is a combination of a MV feeder in the Eskom Yard and a pole mounted Auto-recloser located outside the

substation. The MLM network is arranged in a ring feed arrangement and the Town is reticulated at both 11kV and 6.6kV.

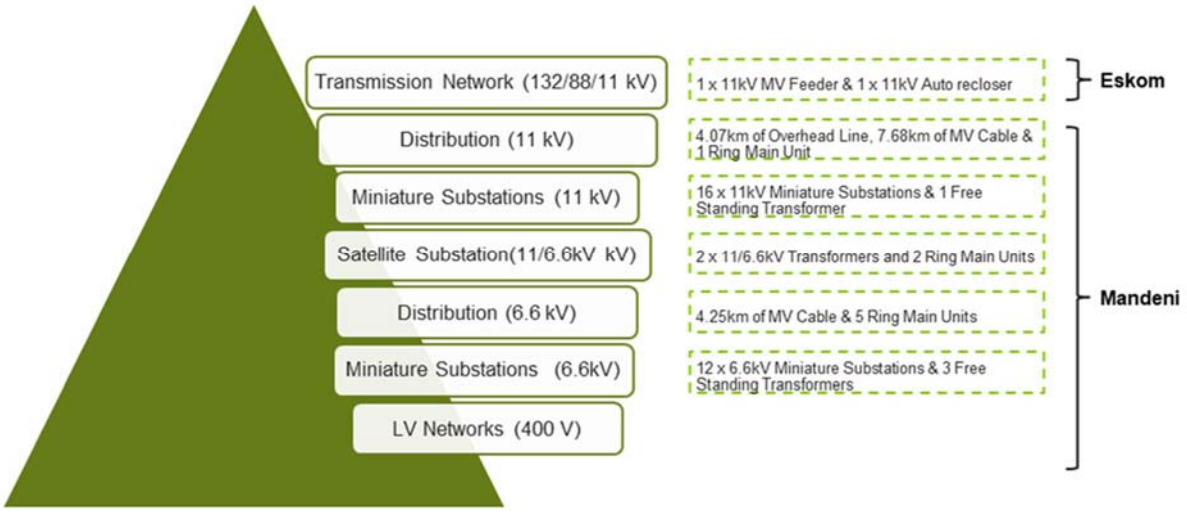


Figure 2: ***Network Hierarchy***

MLM takes bulk supply at 11kV from the Mandeni substation from a single dedicated MV feeder. As the town gets supply via a single overhead line, there is no firm capacity on the bulk supply of electricity. Table 4 below provides a summary of supply at the Mandeni intake point. It must be noted that the Eskom supply substation also supplies Eskom customers and is not dedicated to Mandeni supply area.

Table 4: ***Bulk supply from Eskom Mandeni***

Eskom Point of Supply	Supply Voltage	Substation Firm Capacity	Notified Maximum Demand
Mandeni	11kV	10MVA	3.5MVA

In addition to the above MLM have an independent bulk supply customer Umgeni Water. The supply to Umgeni Water is derived from Eskom Sappi substation. Eskom have provided 1 x 132/33kV 40MVA dedicated transformer and 2 x 33kV feeder bays at Eskom substation. It must be noted that Eskom also supply the Sappi Paper Mill from this substation from two independent 132/33kV 40MVA transformers. MLM have 2 x 33kV feeders from the Eskom Sappi substation to Umgeni Water substation (Mathew substation). The supply to Umgeni water is bulk at 33kV via 2 x 33kV cable feeders aproximatley 4km long. Figure 3 overleaf is a representation of the interconnection from Eskom Sappi substation to Mathew substation.

Figure 3: ***Supply from Eskom substation to Mathew substation***

Table 5 below provides a summary of supply at the Eskom Sappi intake point.

Table 5: ***Bulk supply from Eskom Sappi***

Eskom Point of Supply	Supply Voltage	Substation Firm Capacity	Notified Maximum Demand
Sappi	33kV	40MVA	10MVA

4.1.3.1.2 11kV & 6.6 kV System

MLM have a single 11kV overhead line from the Eskom supply point to their internal 11kV network. The 11kV overhead line supplies the 11kV network which is configured as a ring supplying miniature substations and transformers. The miniature subststaions and transformers then supply reticulation zones to LV customers.

The 6.6kV network is derived from the 11kV supply at two satellite substations. The voltage is stepped down from 11kV to 6.6kV at two points on the 11kV network. Part of the 6.6kV network is ringed for increased reliability and other parts of the network are radial. The 6.6kV feeders supply miniature substations and transformers which in turn supply reticulation zones to LV customers.

MLM do not have any major Distribution substations or switch stations. There are only two outdoor satellite substations that are made up of floor standing transformers and ring main units. Both these satellite substations have 1 x 1.25MVA 11/6.6kV transformers, therefore no firm capacity.

The 11kV network is constructed with a mix of overhead line, strung with Oak, Mink and Fox (on wood pole structures) and underground cable (70mm^2 Copper PILC). There is approximately 4km of overhead line and 7.7km of underground cable.

The 6.6kV network is constructed with underground cable (70mm^2 Copper PILC). There is approximately 4km of overhead line and 7.7km of underground cable. Figure 4 below is a graphical

representation illustrating the extent of the 11kV and 6.6kV networks and connection to Eskom infrastructure.

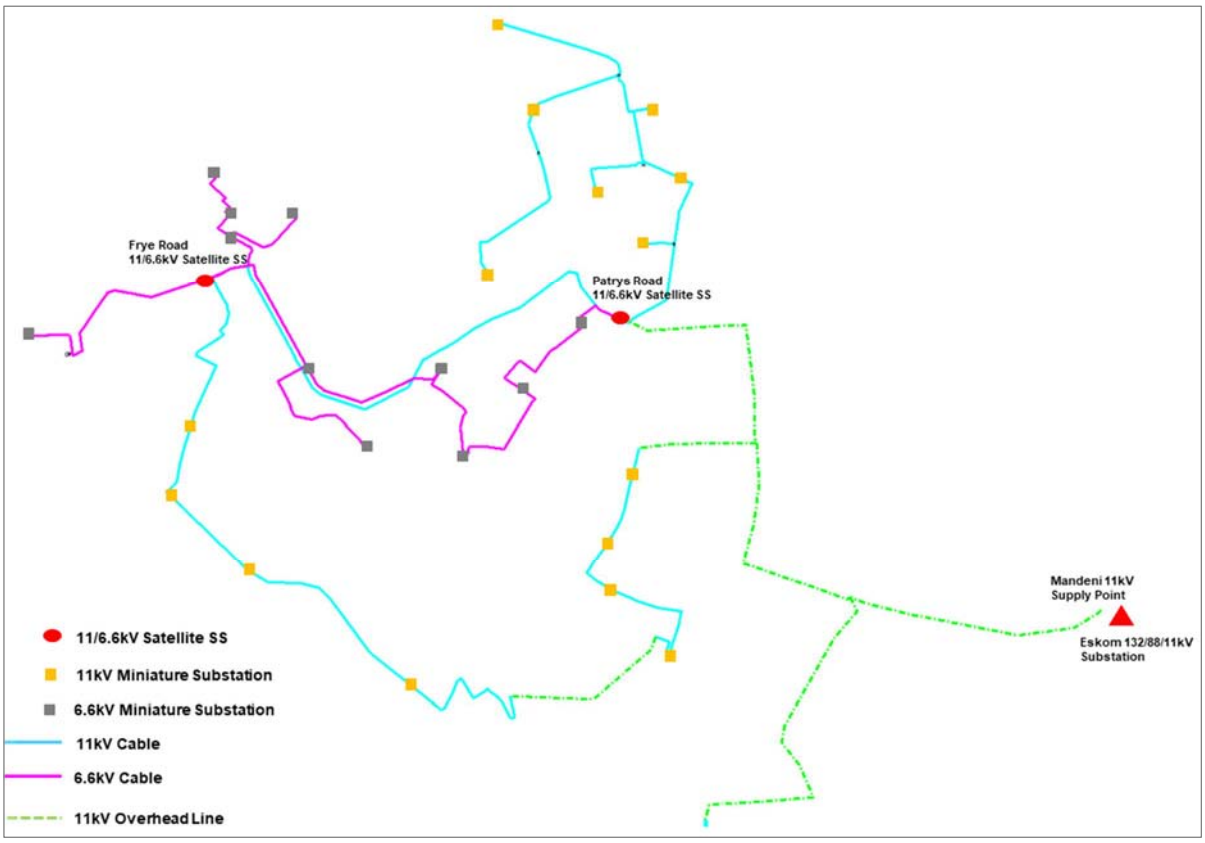


Figure 4: ***Spatial Representation of the 11/6.6kV networks***

The extent of 11/6.6kV distribution devices on the MLM network are highlighted below,

- 1250kVA transformers with a total of 2.
- Ring Main Units with a total of 2.

The extent of 11kV distribution devices on the MLM network are highlighted below,

- 315kVA miniature substations with a total of 16
- Ring main units with a total of 1.
- 200kVA free standing transformer with a total of 1.

The extent of 6.6kV distribution devices on the MLM network are highlighted below,

- 100kVA, 200kVA, 300kVA, 315kVA miniature substations with a total of 12.
- Ring main units with a total of 5.
- 150kVA, 500kVA free standing transformer with a total of 2.

4.1.3.2 General Infrastructure Assessment

Reference information received in this regard, consist of:

- Electricity Master Plan

- Replacement of 6.6kV network Mandeni Report

It must be noted that no additional information was available such as asset registers with condition-based data. Based on the AMP developed in 2019, it was noted that the asset register was considered not sufficiently reliable with no asset health information.

It can be noted that the MLM Distribution networks have been in service for many years and much of the network is aged. Much of the electricity network within MLM's supply area was designed or strengthened in the early 1980's with an expected life of 25 years. Such networks may begin to exhibit degradation in reliability, performance, and functional inadequacy.

4.1.3.2.1 11kV & 6.6 kV Substations

A condition assessment was done during the 2019 Master Plan based on visual inspection. Infrastructure constraints were identified as the bulk of the electricity network was developed many years ago and has since deteriorated or become obsolete through time, technological changes and/or expected useful life. Some of the issues identified include,

- Blown up miniature substations
- Miniature substation transformers bypassed
- Bypassed Magnafix units due to failure
- Lack of labelling
- General damage such as holes in miniature substations enclosures, oil leaks, vegetation etc.

The transformers and miniature substations assessed as part of the 2019 EMP has been categorised with ratings as tabled below.

Table 6: ***Condition Ratings***

Rating	Condition	Description
5	Excellent	No visible defects, new or near new condition, may still be under warranty if applicable
4	Good	Minor deterioration, equipment may be slightly outdated but still meets needs of facility with minimal routine maintenance
3	Adequate	Repairs are needed; some deterioration exists, and maintenance needs are considerable. However, equipment meets needs and is still within its useful life
2	Marginal	Equipment has exceeded useful life; defects are critical and/or widespread; no longer meets needs or current standards and requires partial replacement at a minimum
1	Poor	Equipment is well past its useful life and has critical defects affecting function and ability to meet standards. Issues are beyond repair and warrant detailed review

With respect to the 11kV miniature substations the following can be noted,

- Three are categorised as poor and indicates a need for replacement.
- Twelve are categorised as adequate with routine maintenance and labelling requirements.
- One is categorised as good which is midlife and the latest miniature substation to be added to the network.

With respect to the 11/6.6kV satellite substations and 6.6kV miniature substations the following can be noted,

- The 11/6.6kV satellite substations are categorised as good as they have been refurbished.
- All of the 6.6kV miniature substations are categorised as marginal indicating equipment has reached useful life with defects affecting functionality.

From the analysis, it can be noted that substantial portions of the Mandeni electrical network are approaching or have exceeded useful life specifically the 6.6kV network. There is a general need for routine maintenance and a requirement to replace the 6.6kV equipment with 11kV equipment which is considered a more appropriate system voltage level.

4.1.3.2.2 Single Line Diagram & GIS Data

There are currently no single line diagrams (SLD) available for MLM. The network has been drafted as a spatial representation of the 11kV and 6.6kV networks within a GIS platform. Considering that this network is relatively small with a limited number of assets, constructing these drawings as a single line representation is considered a relatively simple task, however the required drafting tool such as CAD may not be available to the utility. An SLD will enable easy visualisation of power flow in a network, interconnectivity, visualisation of switching devices, network switching arrangements, equipment key ratings etc. and it is recommended that this be developed.

The MLM electrical network is shown overleaf on Figure 5 and includes the following,

- 11/0.4kV and 6.6/0.4kV Miniature substations and transformers
- 11/6.6kV Outdoor Transformers
- 11kV Overhead Lines and Poles
- 11kV and 6.6kV MV Cables
- 11kV and 6.6kV MV Ring Main Units

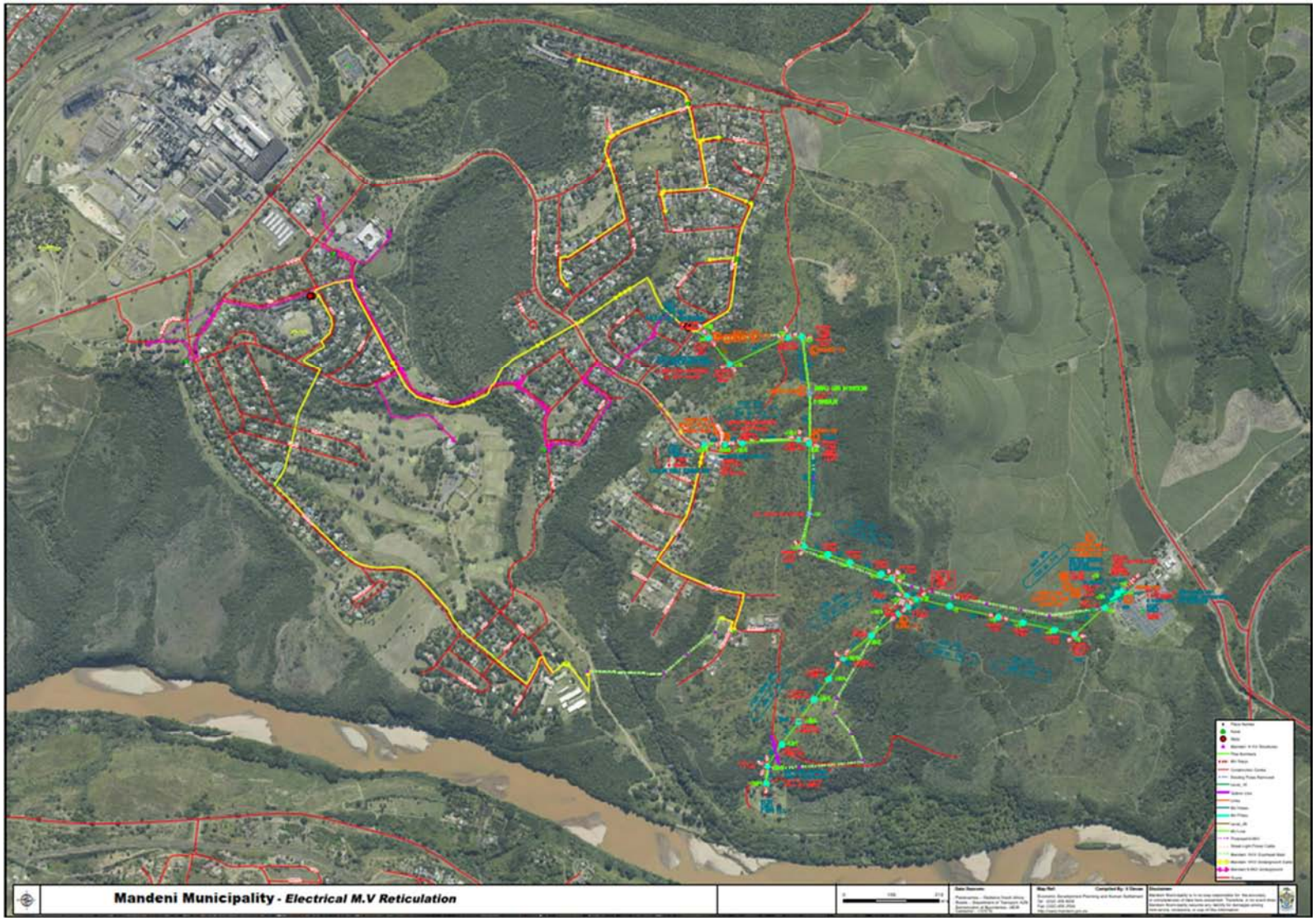


Figure 5: ***Extent of electrical infrastructure within the GIS data base***

4.1.3.2.3 Network Loading & Modelling

Figure 6 below is an indication of the loading identified during the 2019 master plan revision for the period 2016-2017 and Figure 7 is an indication of the most recent loading in 2022. The supply has a notified maximum demand of 3.5MVA and currently peaks at around 2.5MVA consistently. Based on historic and current loading it can be noted that there has been limited growth within the supply area. Electricity consumption in the town of Mandeni is stable with a buffer of around 1MVA for future growth.

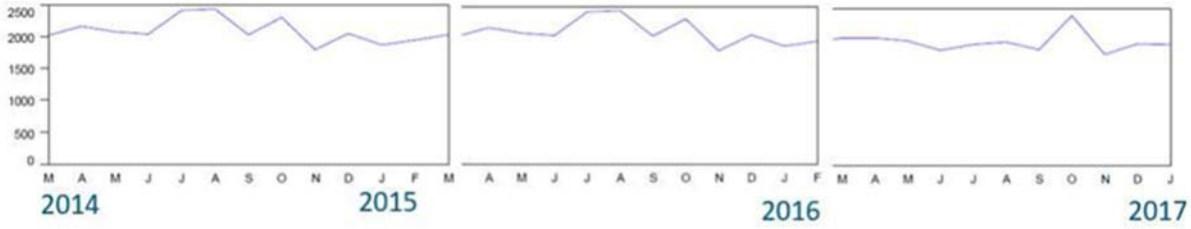


Figure 6: ***Mandeni Electrical Loading 2014-2017***

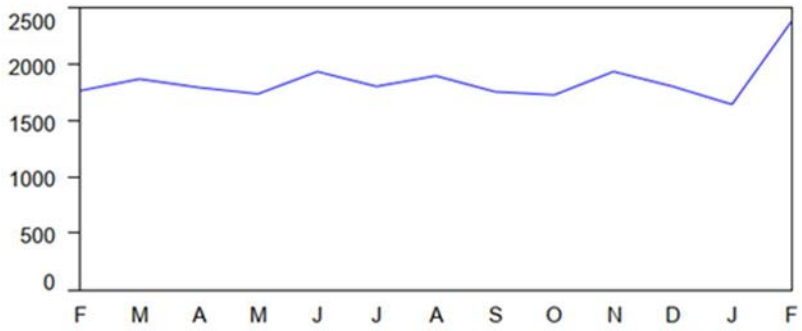


Figure 7: ***Mandeni Electrical Loading 2022***

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 but rather lumped loads representing each transformer load. For the purpose of a planning study, this can be considered acceptable.

The load flow analysis concluded that the 11 kV and 6.6 kV networks are sufficient in terms of current capacity in the contingency state. The additional impedance of the 11/6.6kV transformers results in voltage regulation of the 6.6 kV network that is exceeding SANS 507 norms. The 6.6kV network has been earmarked for replacement as part of the EMP study and this upgrade will remove the voltage regulation issue identified.

With respect to the bulk supply customer Umgeni Water, no analysis was considered for this supply however the current infrastructure is considered adequate for the current notified maximum demand of 10MVA. The demand at Umgeni Water for February 2022 is shown in shown on Figure 8 overleaf and is around 2.7MVA. This can however fluctuate to higher demands with this being a high lift pumpstation.

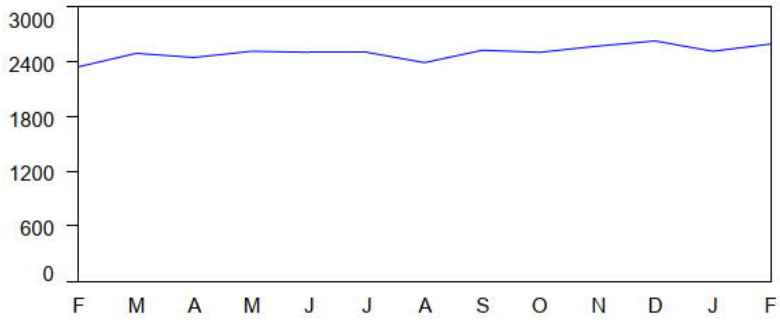


Figure 8: ***Umgeni Electrical Loading 2022***

4.1.3.3 General Assessment of Metering & Meter Reading for bulk purchases

ESKOM

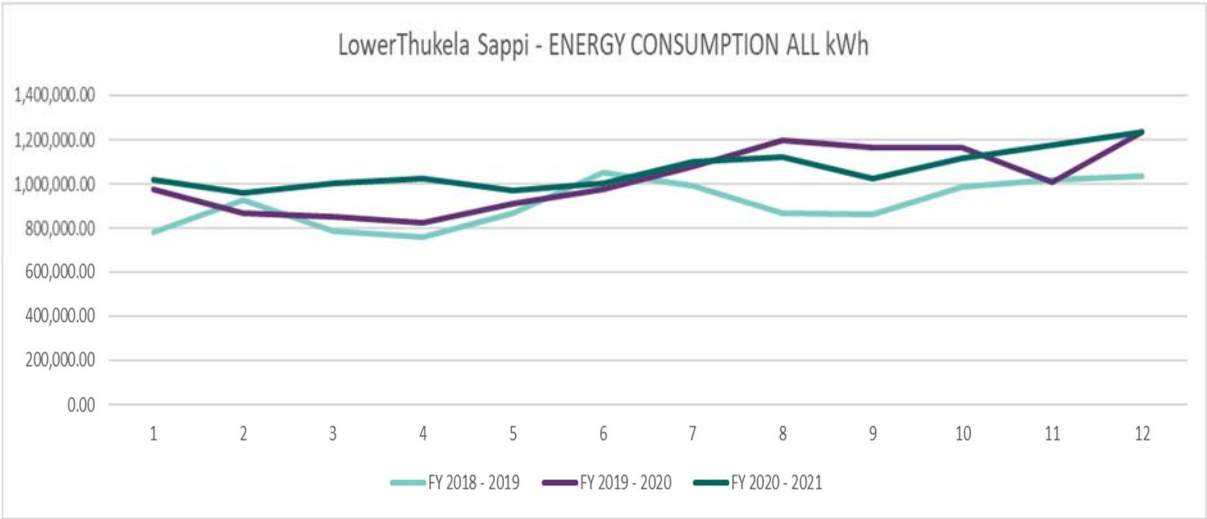
Reference information received in this regard consisted of the ESKOM invoicing for the periods July 2018 to June 2019, July 2019 to June 2020, and July 2020 to June 2021. The documents are in PDF format and consist of an invoice per intake point per month as well as a consolidated invoice per month.

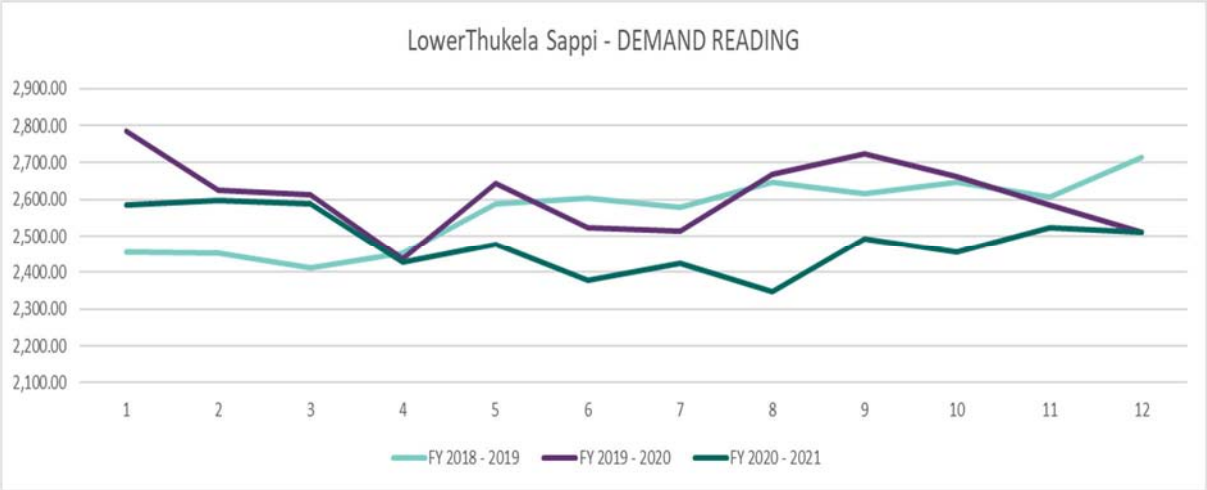
The invoice data has been consolidated by Zutari into an annual overview per intake point as well as a combined annual overview. Please refer to Annexure 1 for the detailed overview of the annual data per intake point for the last 3 financial years.

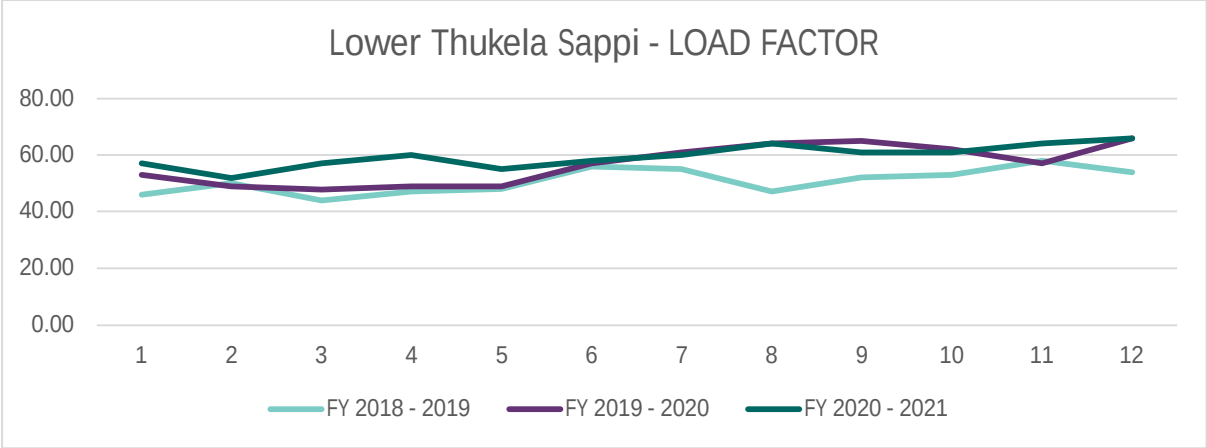
LOWER THUKELA SAPPI

The graphs below provide an overview of the Lower Thukela Sappi 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.



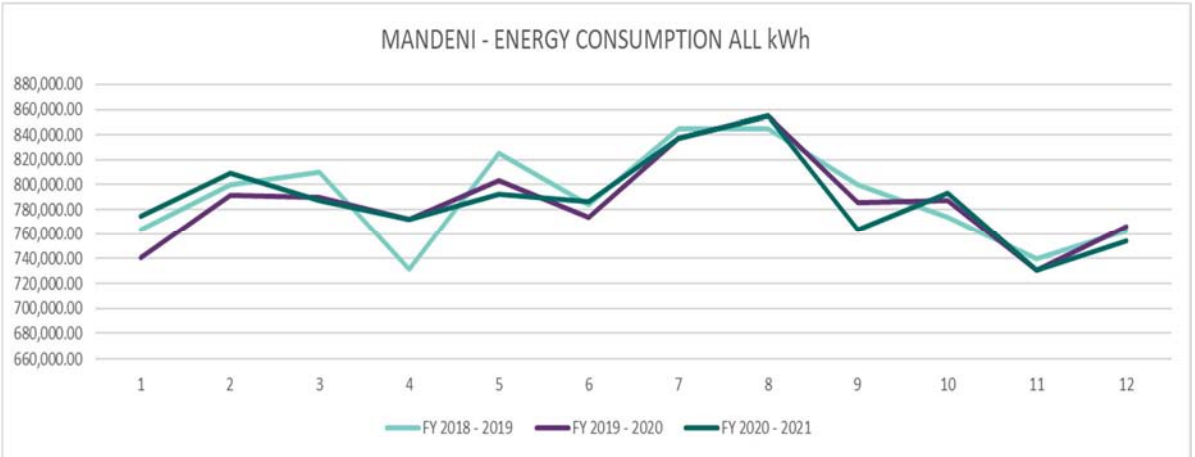


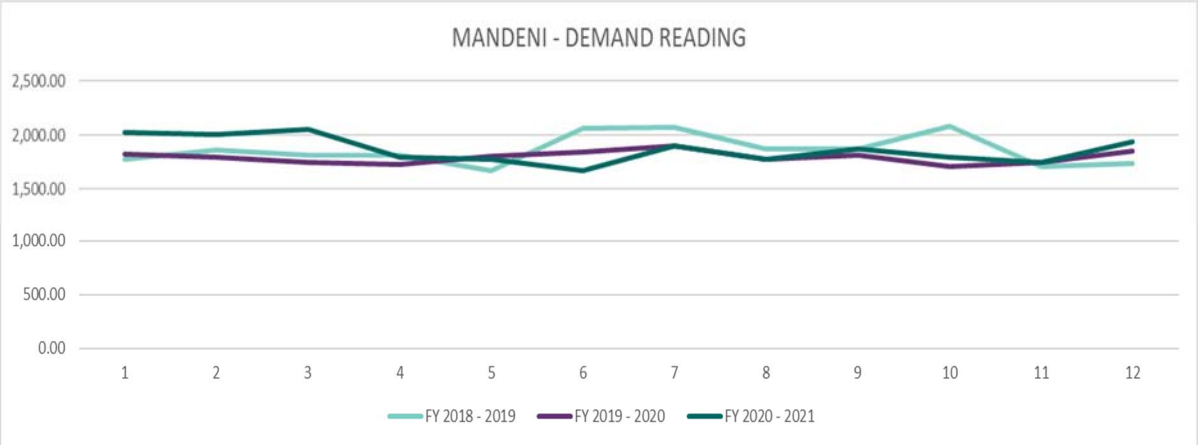


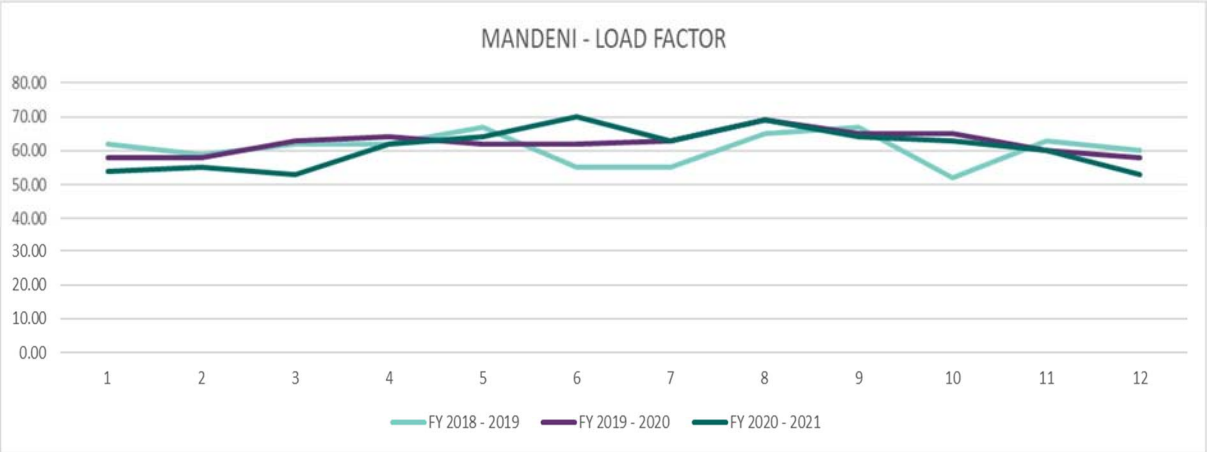
MANDENI POS

The graphs below provide an overview of the Mandeni 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.







Observations:

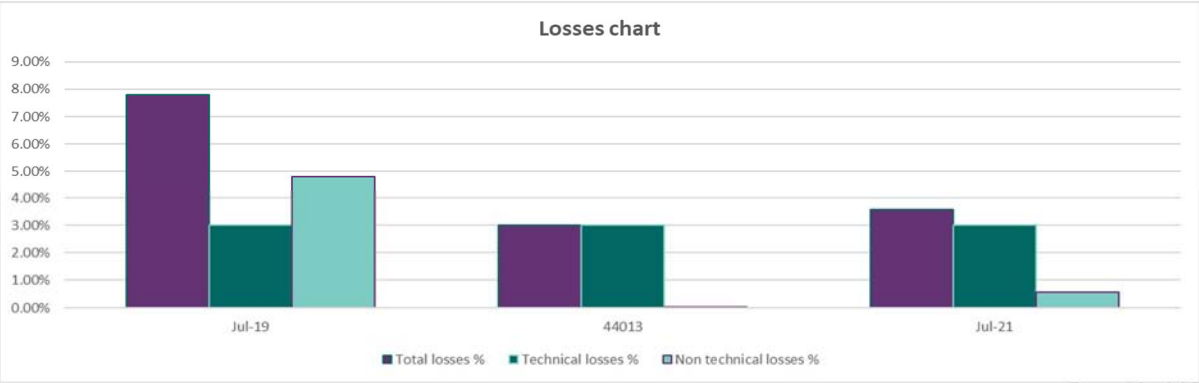
- Unlike KDM with a single Eskom account and three premise IDs for their three intake points, MLM have separate account numbers for the two intake points. This can be attributed to premise ID 6274494579 being a dedicated supply point for Umgeni water as the only consumer and was established via a three-way SLA agreement around 2015.
- No MLM check meters exist and reliance is placed completely on the accuracy of Eskom measuring equipment.
- Umgeni water as a single customer has more than double the energy consumption of the whole of the rest of MLM.
- Mandeni intake point has a monthly Network Demand Charge / kVA as well as an Energy Demand Charge / kVA. This is because of the municipality being on the Eskom tariff called Nightsave Urban kVa Interval. It results in MLM paying more per GWh than the metros of the country.

MLM		
Concept	Tot al Jul-18 to Jun-19	
GWh	9.53	
R	9,914,294.65	
R/GWh	1,040,172	
USD/GWh	69,345	
R/USD		
FY2018/19 D-form	R/GWh	USD/GWh
BCM	909,364	60,624
CoCT	873,246	58,216
Ekur	814,410	54,294
Ethe	805,735	53,716
CoJ	958,833	63,922
Mang	910,858	60,724
NMB	891,441	59,429
CoT	824,946	54,996
Total 8 Metros	862,269	57,485
MLM Jul-18 to Jun 19	1,040,172	69,345
MLM/ 8 Metros	1.21	1.21

NERSA D FORMS

D Forms were received for the financial years ending July 2019, July 2020, and July 2021. Below table and graph provide a summary of the information. Being a small municipality, technical losses were considered to be at 3%.

NERSA D FORMS SUMMARY	FINANCIAL YEAR ENDING					
	Jul-19		Jul-20		Jul-21	
Energy Purchased in kWh	20,441,858		21,548,189		22,211,843	
Energy Sold in kWh	Units	% of Energy bought	Units	% of Energy bought	Units	% of Energy bought
Free basic electricity	0	0.00%	0	0.00%	0	0.00%
Domestic (prepaid)	3,637,913	17.80%	4,053,916	18.81%	4,609,747	20.75%
Domestic (conventional)	4,123,980	20.17%	4,563,258	21.18%	1,466,398	6.60%
Commercial (conventional)		0.00%		0.00%	2,354,670	10.60%
Commercial (prepaid)	0	0.00%	0	0.00%	0	0.00%
Street lighting	131,040	0.64%	193,551	0.90%	150,000	0.68%
Other sales	10,952,766	53.58%	12,088,896	56.10%	12,836,809	57.79%
Total Sales	18,845,699	92.19%	20,899,621	96.99%	21,417,624	96.42%
Total losses in kWh	1,596,159		648,568		794,219	
Total losses %	7.81%		3.01%		3.58%	
Technical losses %	3.00%		3.00%		3.00%	
Non technical losses %	4.81%		0.01%		0.58%	

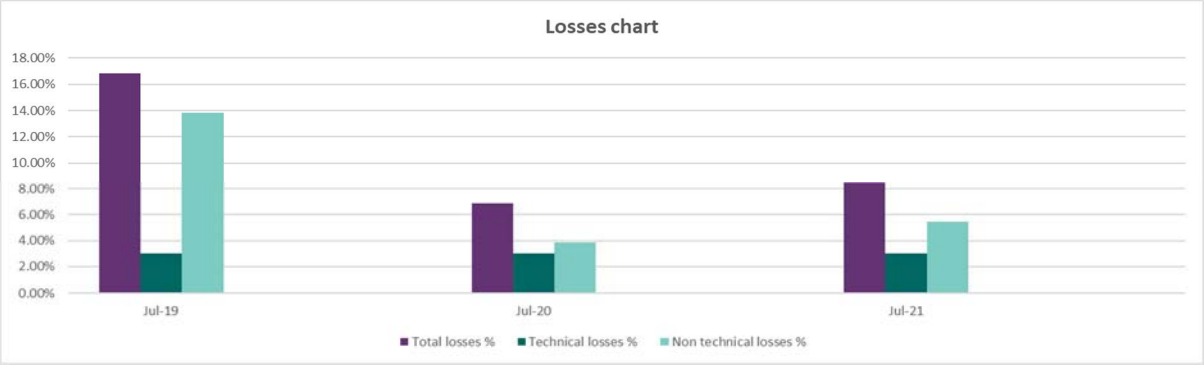


As it was established that Umgeni water's consumption is more than double that of the rest of Mandini, an analysis was also done by excluding Umgeni water, by assuming zero losses for Umgeni water as it is basically a stand-alone feed. The table and graph below indicate the effect thereof.

NERSA D FORMS SUMMARY	FINANCIAL YEAR ENDING		
	Jul-19	Jul-20	Jul-21
Energy Purchased in kWh (excl Umgeni water)	9,489,092	9,459,293	9,375,034

Energy Sold in kWh	Units	% of Energy bought	Units	% of Energy bought	Units	% of Energy bought
Free basic electricity	0	0.00%	0	0.00%	0	0.00%
Domestic (prepaid)	3,637,913	17.80%	4,053,916	18.81%	4,609,747	20.75%
Domestic (conventional)	4,123,980	20.17%	4,563,258	21.18%	1,466,398	6.60%
Commercial (conventional)		0.00%		0.00%	2,354,670	10.60%
Commercial (prepaid)	0	0.00%	0	0.00%	0	0.00%
Street lighting	131,040	0.64%	193,551	0.90%	150,000	0.68%
Total Sales	7,892,933	38.61%	8,810,725	40.89%	8,580,815	38.63%

Total losses in kWh	1,596,159	648,568	794,219
Total losses %	16.82%	6.86%	8.47%
Technical losses %	3.00%	3.00%	3.00%
Non technical losses %	13.82%	3.86%	5.47%



A further analysis was also done by taking the number of consumers per category and determining and average consumption per consumer per category. Below table illustrates this analysis.

Energy Sold in kWh	Units	Number of customers	Units per customer	Units	Number of customers	Units per customer	Units	Number of customers	Units per customer
Free basic electricity	0	0	0.00	0	0	0.00	0	0	0.00
Domestic (prepaid)	3,637,913	662	5,495.34	4,053,916	681	5,952.89	4,609,747	739	6,237.82
Domestic (conventional)	4,123,980	315	13,092.00	4,563,258	299	15,261.73	1,466,398	163	8,996.31
Commercial (conventional)	0	50	0.00	0	50	0.00	2,354,670	49	48,054.49
Commercial (prepaid)	0		0.00	0	0	0.00	0		0.00
Street lighting	131,040	1	131,040.00	193,551	1	193,551.00	150,000	1	150,000.00
Other sales	10,952,766	1	10,952,766.00	12,088,896	1	12,088,896.00	12,836,809	1	12,836,809.00
Total Sales	18,845,699	1,029	18,314.58	20,899,621	1,032	20,251.57	21,417,624	953	22,473.90

Observations:

- Generally total losses are well within the NERSA benchmark of 11%, except for FY2019 sitting at 16.82% if Umgeni water is discounted.
- Although a significant decrease from 2019 to 2021, an increase is noted in 2021. This is not yet alarming though, but recommendation is that it be monitored annually.
- It was noted that for 2019 and 2020, 50 commercial customers were indicated, however no units sold. This may be an indication of the D forms not being completed correctly.

- It also noted that conventional domestic customers are decreasing year on year, while prepaid domestic increases year on year. This can be expected as it is generally accepted that faulty conventional domestic meters will be replaced with prepaid meters. It is however noted that especially for FY 2021 the decrease in domestic conventional customers is disproportionate to the increase in prepaid domestic customers. This may well indicate data inaccuracies. From 2020 to 2021, MLM's customer base decreased by 79 or 7.66% of the 2020 customer count.
- When looking at the income statement on the D Form it can be noted that the expenses have increased from R23 mil in 2019 to R37 mil in 2020 to R47 mil in 2021. The 2019 expenses did not include any costs attributed to FBE or other expenses such as subsistence, travelling, uniforms etc. The increase seen from 2020 to 2021 can be attributed to costs under fuel and oil at R3.3 mil and prepaid electricity vendors at R4.7 mil which does seem to be excessively high.

Conclusion:

Based on D Forms data, we conclude that losses within MLM are not of grave concern, however some administrative issues need to be resolved to ensure quality of data and optimal revenue collection.

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

As far as can be determined, the only LPU in MLM is Umgeni water as highlighted above.

MLM invoices to Umgeni Water as received, reflects that MLM only charges a 10% markup fee to Umgeni water based on Eskom billing to MLM. Below illustration is an extract from the February 2022 invoice to Umgeni water. The highlighted section clearly indicates the 10% markup fee.

Date	Service rendered/goods supplied	Unit of Mearsurement		Tariff	Amount
2022-01-14 to 2022-02-13	TOTAL CHARGES BILLING FOR THE PERIOD				
	Administration Charge	31.00	days	R 125.02	R 3,875.62
	TX Network Capacity Charge	10000.00	kVa	R 11.24	R 112,400.00
	Network Capacity Charge	10000.00	kVa	R 22.26	R 222,600.00
	Network Demand Charge	2594.40	kVa	R 42.21	R 109,509.62
	Ancillary Service Charge	1645791.00	kWh	R 0.0055	R 9,051.85
	Low Season Standard Energy Charge	587695.00	kWh	R 0.9756	R 573,355.24
	Low Season Peak Energy Charge	238521.00	kWh	R 1.4176	R 338,127.37
	Low Season Off Peak Energy Charge	819574.00	kWh	R 0.6188	R 507,152.39
	Electrification and Rural Subsidy	1645791.00	kWh	R 0.11	R 177,745.43
	Service Charge	8597.85	Fixed	R 1.00	R 8,597.85
	Handling fee	2062415.38	%	R 0.10	R 206,241.54
	Grand total				**R 2,268,656.91**
	Vat @ 15%				**R 340,298.54**
	Amount Due				**R 2,608,955.45**

Observations

- Sole reliance is placed on accuracy of Eskom metering to bill Umgeni water. This may not be such an issue with only one LPU customer but could become one when more LPU customers are added to the grid.
- MLM is may well be setting a precedent in this regard as other potential LPU customers may well demand the same kind of agreement.
- A proper tariff structure in line with a proper tariff policy may well suit MLM better in this regard.

4.1.3.5 Roles & Responsibilities

4.1.3.5.1 Electricity Department

The organogram represented in Figure 9 overleaf illustrates the organogram of the Technical Services & Infrastructure Development Department.

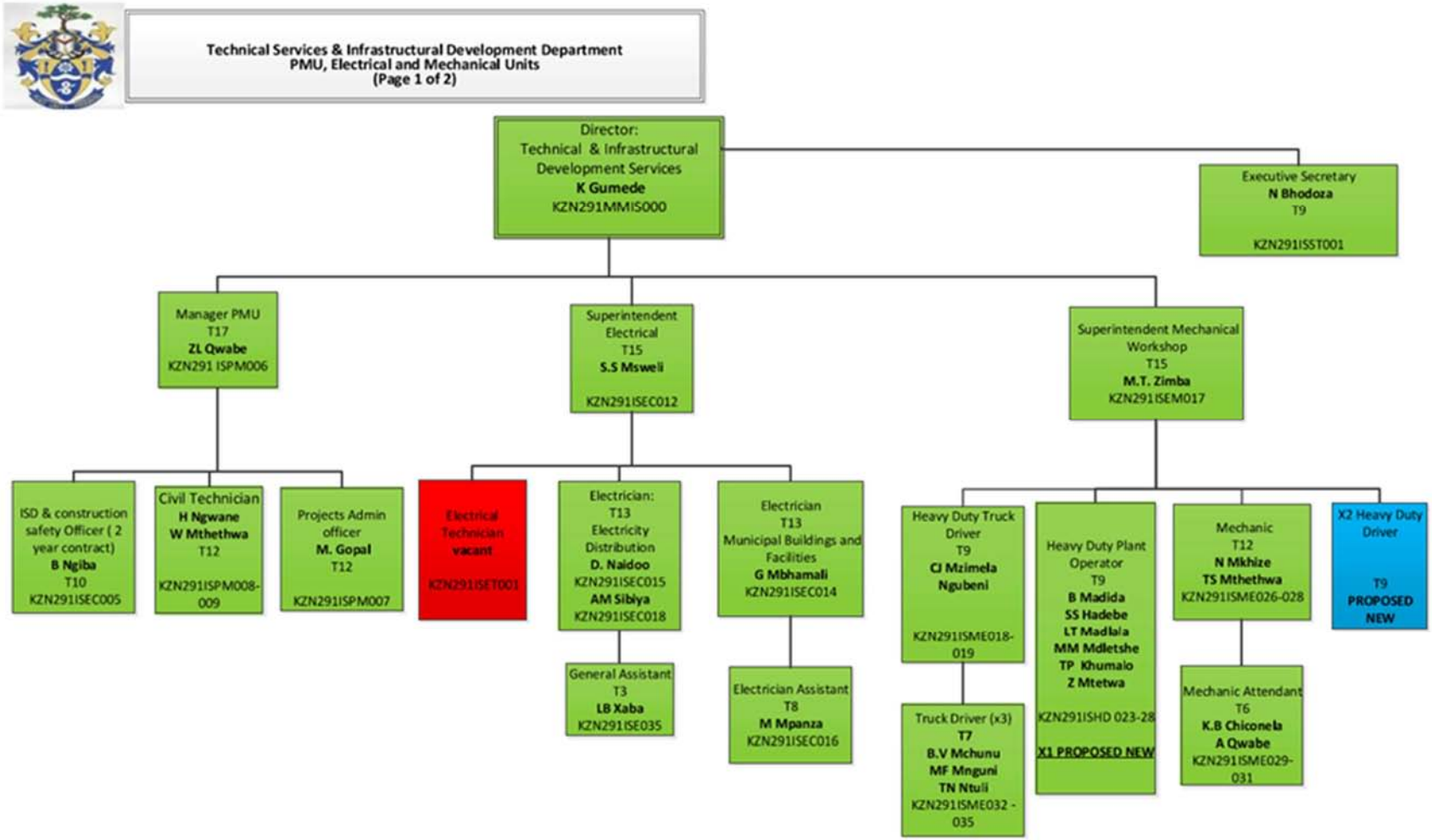


Figure 9: ***Technical Services & Infrastructure Development Organogram***

Observations:

- The electricity department is a sub-department of the Technical Services & Infrastructure Development Department.
- The whole department is headed by Mr K Gumede, with Mr Selby Msweli heading up the electrical department.
- The electrical department shows one electrical technician vacancy at this stage and a proposed heavy-duty driver.
- It is not clear from the organogram whether the positions within the electrical department are sufficient to handle the workload. It is however normal practice for artisans to assist each other during significant incidents as well as share standby duties.
- The Mandeni AMP 2019 does however note that there are currently management positions currently not filled with a need for a competent person type 1(c) and 1(d) to be appointed as per the General Machine Regulations 2(1) responsible person.
- The Mandeni EMP has identified a need for an updated structure within the electrical department which expands on the current structure to introduce 3 streams, Municipal Buildings, Reticulation System and Street Lighting. The proposed organogram can be seen in the Figure 10. and indicates a need for additional artisans specifically for streetlights repairs and maintenance which is being done in-house by the municipality through agreements with Eskom in order to expedite response to streetlights that are not working.

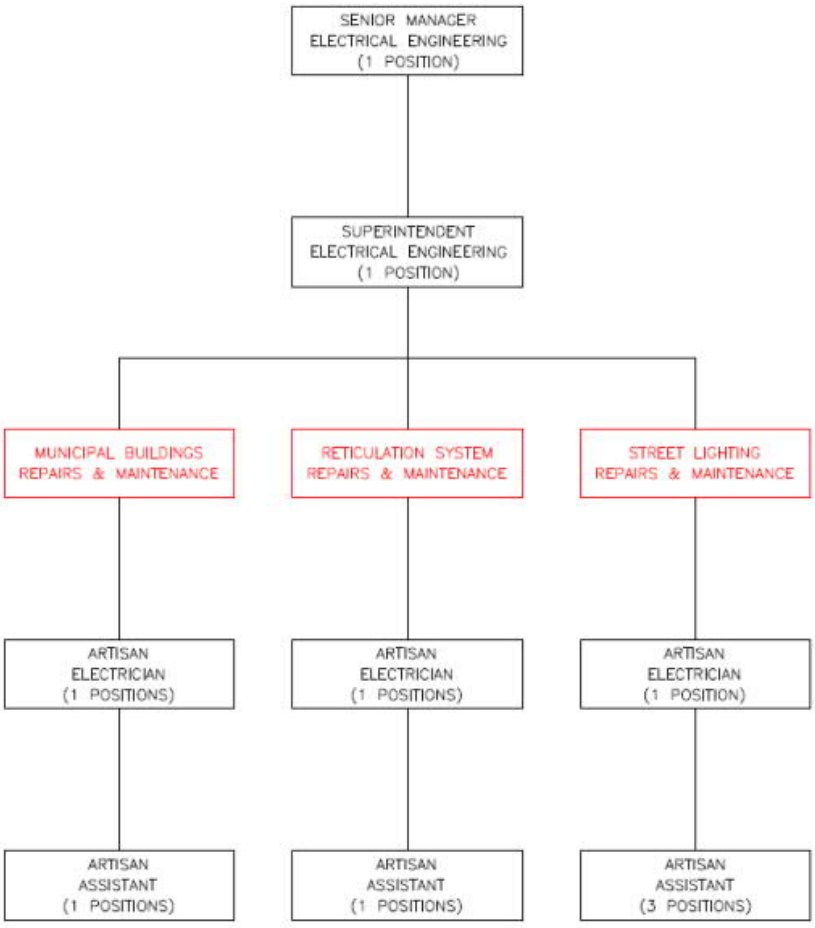


Figure 10: ***Recommended organogram of the electrical department***

4.1.3.5.2 Finance Department

The diagram below illustrates the organogram of the Budget & Treasury Office Department.

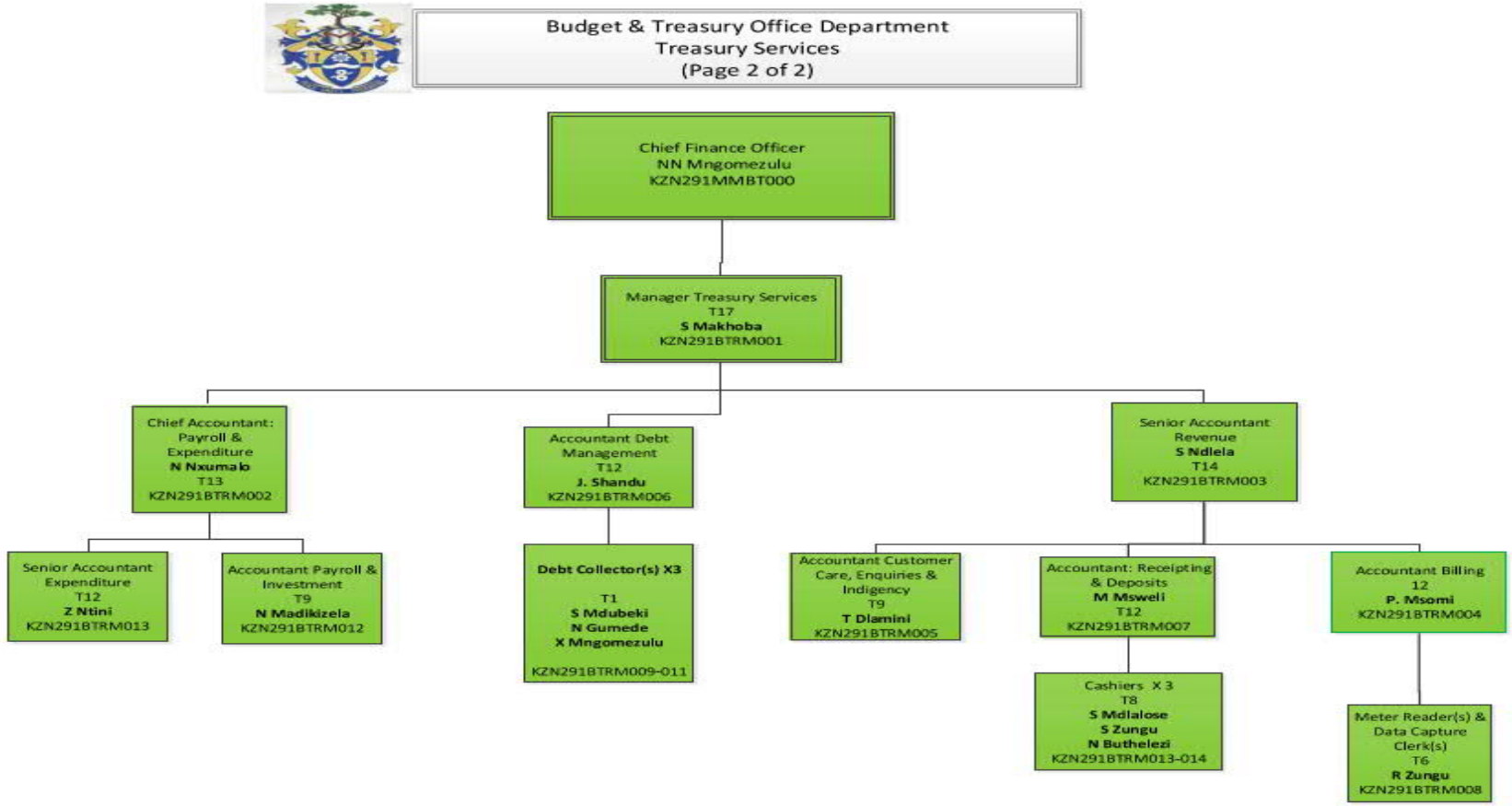


Figure 11: Organogram of the finance department

The organogram indicates a total complement for the Revenue department (including meter reading) of 8 people and for credit control (debt management) a total of four. No vacancies exist. It is not clear though whether the staff complement is sufficient to manage the workload.

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

4.1.3.6.1 Bylaws

MLM 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 revision date of the bylaws is not indicated, and it is possible that the bylaws are not up to date in all instances.

4.1.3.6.2 Policies

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

Asset Management Policy: MLM currently have a draft Asset Management Policy 2022/2023 in place that is considered comprehensive and covers key aspects required for asset management. The objective this policy is consistent application of asset management principles, implementation of accrual accounting and complies with the MFMA, Treasury Regulations and other related legislation.

Tariff Policy: MLM currently have a Tariff Policy 2021/2022 and a draft Tariff Policy 2022/2023 in place. The objective of the policy is to ensure tariffs comply with legislation, Municipal services are financially sustainable, affordable and equitable with consistency in how the tariffs is applied across the municipality and aligned to the principles outlined in the Municipal Systems Act. The tariffs for economic services are fixed in such a way that full cost of providing the service is recovered without incurring a surplus or deficit. Subsidised tariffs are fixed in such a way that at least a portion of the cost providing the service can be recovered.

Indigent Support Policy: the policy is in place to provide procedures and guidelines for the subsidisation of basic services to its indigent households using the Councils budgetary provisions received from Central Government. This policy provides the relevant criteria for qualification for indigent support and control measures for the distribution of 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. Some of the recommendations include stipulating the extent of kWh of free electricity that will be provided monthly, clearly define the period for being a valid indigent customer, prepare standard operating procedure to assist official etc.

Credit Control & Debt Collection Policy: 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. In addition, it is aimed at identifying defaulters and ensure that their failure to meet their financial obligations towards the Council are treated in a consistent, fair and effective manner.

4.1.3.6.3 Tariff Setting

MLM has a draft tariff policy 2022/2023. The principles of this policy indicates that tariffs must be set at a level to facilitate financial sustainability. Electricity falls under the trading service category and Council's pricing strategy for this service is to recover the full cost of rendering the service to the

community. The policy acknowledges that a minimum amount of basic services such as electricity must be free for poor households and tariffs kept at affordable levels.

The tariff structure of MLM makes provision for different categories of customer such as,

- Domestic
- Commercial
- Large Customers
- Bulk Supply

Tariffs are reviewed during the preparation of the annual budget in accordance with the Tariff Policy and the tariff determination process is conducted in line with the MSA,

- Levy and recover fees, charges or tariffs in respect of any function or service of the municipality,
- That such fees and charges levied are passed by the municipal Council with a supporting vote of its majority members.
- The proposed tariffs will be presented to the community during Council's consultations process about the budget.

MLM currently has a final tariff of charges for the year 2021/2022 and can be found under Annexure 2. The tariffs indicated overs the 2 past two financial years indicate a general increase across energy tariff and service charges. 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. Considering that the utility has not conducted a detailed tariff study in recent years may indicate that the current tariffs may not be completely cost reflective with a need for a study in the near future.

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. MLM currently does not formally implement a lot of asset management systems and have a relatively low asset management practice maturity, especially in the field of physical asset management within the utility. These poor asset management practices are related to skill challenges and constrained budgets. The current practise was assessed to be predominantly "aware" of good practices and the municipality aims to move towards a level of competence.

This AMP compiled 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. In terms of priority improvements, the proposed improvement plan prioritises an improvement of the maintenance management process followed by an enhancement of the asset register and finally improving the management processes associated with projects.

The fixed asset register for electrical assets compiled/updated in 2019 was provided. The register provides a fair representation of assets installed with accounting-based data. The detail is however limited in terms of condition, age of asset, extent of cables/lines (length) and therefore has a need for enhancement.

4.1.3.6.5 Budget for Operations & maintenance

MLM have identified electrical infrastructure repairs and maintenance budgets for financial years 2022/2023 and 2023/24 and are indicated below.

Table 7: Planned Repair and Maintenance Budgets

REPAIR AND MAINTENANCE	2022/23	2023/24
Power Plants	R 156 000,00	R 163 000,00
HV Transmission Conductors	R 625 000,00	R 653 000,00
MV Substations	R 156 000,00	R 163 000,00
MV Networks	R 208 000,00	R 218 000,00
LV Networks	R 1 103 000,00	R 1 244 000,00
Capital Spares	R 918 000,00	R 929 000,00
Grand Total	**R 3 367 000,00**	**R 3 370 000,00**

Considering that there is a need for additional maintenance on existing failing infrastructure, the current budgets need to be reassessed to meet the current network needs.

There are currently no major projects that have been budgeted for with current budgets directed to operational and maintenance activities. There is however a need to replace the existing 6.6kV networks which forms part of the EMP recommendations.

The MLM D forms were assessed over the past 3 financial years and the following expenses under the income statement were identified in Table 8 below. The detailed breakdown of revenue, expenses, electricity purchases and sales etc. for 2019, 2020 and 2021 can be found under Annexure 3 Distribution Forms.

Table 8: ***MLM Expenses over three financial years***

Description	Expenses 2019	Expenses 2020	Expenses 2021
Electricity Purchase Eskom	R 20 441 858.22	R 26 354 808.00	R 28 817 906.00
Repairs, Maintenance & Salaries	R 2 686 452.00	R 2 362 818.00	R 2 774 546.00
Financial Costs (Interest)	R 8 879.89	R 441.49	R 243.01
Notified Maximum Demand Costs	R 0	R 0	R 0
Other Expenses (Bad debts, FBE to Eskom)	N/A	R 2 091 134.00	R 4 946 875.00
General Expenses (Depreciation, Collection Costs, audit fees etc.)	N/A	R 6 768 058.00	R 10 535.451
Total	**R 23 139 190.00**	**R 37 577 260.00**	**R 47 075 217.00**

It can be noted that when comparing the repairs and maintenance spend to revenue over sales of electricity, the repairs and maintenance spend falls within the 6% range of electricity sales for 2020 and 2021. The other expenses such as Free Basic Electricity (FBE) has increased from around R1.37 mil to R1.58 mil from 2019 to 2020. For the financial year 2019 no general expenses or other expenses were populated within the D Form.

4.1.3.6.6 Technical Management Information system

The extent of information systems within the utility is documented at a high level within the Information Systems Assessment and Improvement Plan compiled for Mandeni in 2019. It can be noted that there is a general lack of information systems to support electricity service delivery, maintenance, and asset management.

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 systems 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.

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. The Mandeni MV electrical infrastructure has been captured within the ESRI GIS platform and is considered accurate and up to date. This software package has a standalone license for the ArcGIS Desktop Basic version 10.6 with a one-year maintenance package that is currently being renewed. The ArcGIS software currently does not have interface with any other systems.

Financial Management: MLM utilise Sage Evolution version 10.1.3.005 which is an integrated financial management and internal control system which is mSCOA compliant. This is the main accounting system used for budgeting, supply chain management, billing, revenue, reporting etc. The service provider for Sage is CGC Systems which is a service provider for mSCOA implementation and support in South Africa and MLM have a 5-year service level agreement for maintenance and support. With respect to payroll, MLM utilise a software called PayDay for payroll which has an interface to Sage Evolution. In addition to this software a standalone system called Caseware AFS is utilised for the preparation of annual financial statements with no interface to other systems.

Asset Register: MLM utilise the AMS360 asset management software which is a Web-based solution and is mSCOA compliant. This is an independent tool utilised to capture new assets, host existing assets and to verify assets. The information captured within this tool is transferred to Sage and hosted within this platform, there is no direct interface.

Maintenance Management System (MMS): Maintenance management systems are used to manage maintenance of electrical network infrastructure. There are currently no systems in place for the electrical department. MLM have standard operating procedures in place (SOP) and a programme is done manually each month for preventative maintenance. The equipment guidelines are utilised to determine the maintenance needs in terms of extent and frequency.

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 for monitoring the main Intake point auto-recloser. The SCADA system will allow for remote monitoring of the main intake point and provide statistical metering information in real time. This installation has not been completed to date.

The Asset Management Information Systems (AMIS): 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

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 9: Technical Loss Deliverable Breakdown

Main Deliverable	Number	Assessment Item	Reference Material	Source
2. Technical Losses	2.1	Determine energy balance ito: - Quantum of electricity loss - Key elements in grid where losses are occurring - Reasons / causes of losses	Any studies?	Energy
			MLM D Forms	Energy
			Any MLM distribution losses report?	Energy

4.2.3 Situational Analysis Findings

4.2.3.1 Technical Losses Analysis

Reference information received in this regard, consists of:

- MLM EMP
- Replacement of the 6.6kV network Report

The extent of technical losses studies compiled for the MLM electrical networks are limited to one independent assessment conducted as part of the 2019 EMP. No additional information is currently available for technical loss estimation by the utility.

As part of the 2019 Master Plan Revision, technical losses for the MLM 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 estimate of the MV losses were in the 2% range and 6% on the LV networks which is considered relatively high for LV networks in Mandeni supply area. Considering the extent of networks, demand of the current system and comparison to the total losses of 8.47% in 2021 highlighted in the previous section, a benchmark of 3-4% would be considered more likely for technical losses. The losses on the MV network can be mostly attributed to the aged 6.6kV network.

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. The study conducted is a pragmatic approach utilising a combination of network modelling and typical equipment losses to estimate both the MV and LV network technical losses. The preferred would be a comprehensive network model that would provide a higher level of accuracy with typical sample network studies of the LV network. This method would however require statistical metering data across the network which is unfortunately not available for the MLM electrical network.

Assessment of the current network and network studies indicates that 6.6kV infrastructure is currently contributing to the technical losses as well reducing network reliability due to the age and poor condition of equipment.

4.2.3.3 Technical Losses Interventions

To date MLM have not identified any specific activities that will reduce technical losses. They have however identified a need to replace the aged 6.6kV electrical infrastructure with new 11kV infrastructure. This is primarily due to the condition of the 6.6kV network, this upgrade will however assist in the reduction of technical losses.

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.

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 10: 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)	SOP for Meter Movement (Z)	Finance
			SOP for Meter Reading (Z)	Finance
			SOP for Prepaid (Z)	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 systems wrt: - Metering & billing (PP &	Customer Data base from financial system (Z)	Finance
			Any data cleansing project s / report (Z)	Vuthela

		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	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
			SOP - Disconnection non-payment (Z)	Finance
			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
			Customer Data Management report	Vuthela
			Valuation roll (T)	Finance
			Cadastral data (T)	Finance
	3.5	Review report on Customer Relations Management System and / or Information Systems	Any reports / studies on CRM / IS for query logging (Z)	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: - Accuracy of billing - Billed revenue vs collected revenue - Returned mail billings - Rd cheque register - Unallocated receipts - Clearing of suspense accounts - Updating debtor's ledgers	Customer data base with reading and billing history (Z	Finance
			Billed revenue vs collected revenue report (T)	Finance
			Returned mail billings? (T)	Finance
			RD cheque register (T)	Finance
			Unallocated receipts report (T)	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	
	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	Any Indigent register study (Z)	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
			Debt write off policy (A)	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. Tariff code for instance need to be cross referenced to Zone Code / Land use Code.

The following reference information as received:

- Excel file “Mandeni Meter Readings v1”. This file contains record of 162 electricity meters with what seems to be an accumulative meter reading for each.
- Excel file “bca2a38339dc45aa91b0b9cbdb0e71b7”. This file contains a record of 300 prepaid electricity meters and their purchasing history for February 2022.

A comparison of the information received against the valuation roll have revealed the following:

- According to the valuation roll, 7614 unique stand numbers exist in MLM. This implies at least 7614 potential electricity customers. Information received, suggests 162 conventional customers and 300 prepaid customers. Add to that Umgeni water as the only LPU customers, then there is a large gap between potential customers and actual customers (assuming that information received is accurate). This information is inconsistent with what is reported in NERSA D-forms (214 conventional customers and 739 prepaid customers.
- Confirmation was also received that from a recent audit, meters were found in the field that are not in the financial system. It is not clear what the scale was of this audit and what was done with audit information.

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

No SOP’s were received at time of this report. Confirmation was also received that no SOP’s exist and that MLM have a challenge in this regard.

Observations:

- SOPs in form of swim lane workflow processes to be considered as part of the improvement strategy.

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:

- IMQS INFRASTRUCTURE ASSET MANAGEMENT report dated April 2019
- Vuthela PFM data cleansing project report (RUMAS Development and Implementation of Data Management Systems for KwaDukuza, Mandeni and iLembe Municipalities dated 26 June 2021)
- Sage mSCOA brochure.

From the reports it was determined that:

Financial Management System

The IMQS report reflects that MLM makes us of Sage Pastel Accounting as their financial management system. This was confirmed in an e-mail query sent to MLM official.

As indicated in the KDM status quo report, municipal finance management and control system need to be mSCOA compliant.

Online research has revealed that Sage Pastel does indeed provide mSCOA compliant software.

Supplementary Systems:

Prepaid Electricity

The service provider for MLM in this regard is Conlog, a well-known provider of prepaid and smart metering services.

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 Conlog (Pty) Ltd as an STS member, implying that their system is STS compliant.

Observations

- We can confirm that MLM indeed make use of compliant systems
- It does not seem as if there are integration of systems though. Prepaid meter information seems to only reside in the Prepaid system and not in the financial 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.

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.

Information deemed critical for assessment consist of:

- MLM valuation roll
- Customer data base
- Cadastral data

A fairly comprehensive valuation roll was received as well as the following excel files:

The following reference information was received:

- Excel file “April Electricity Consumption”
- Excel file “Customer list from financial system”
- Excel file “09e7d42fac3a4570bd6d9602688493b0” understood to be an extract from the Conlog prepaid vending system for April 2022.

The information received was insufficient to make a proper assessment of the completeness and accuracy of metering of electricity customers.

An analysis of the valuation roll reveals the following:

- General stand analysis
  - 7614 unique stand IDs within the valuation roll.
  - 7520 has the correct SG code of 21 digits.
  - 94 does not and indicates a data clean up exercise.
- Rate category vs Use category analysis
  - 564 stands do not have a rate category or use category

Count of SG NUMBER	RATE CATEGORY	
USE CAT	(blank)	Grand Total
(blank)	564	564
Grand Total	564	564

  - 467 stands are classified as vacant stands.
  - Assessment of this aspect can therefore not be made at this stage.

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.

The only information received at time of report in this regard are:

- Excel file "Mandeni Meter Readings v1". This file contains record of 162 electricity meters with what seems to be an accumulative meter reading for each.
- Excel file "bca2a38339dc45aa91b0b9cbdb0e71b7". This file contains a record of 300 prepaid electricity meters and their purchasing history for February 2022.

Refer section 4.3.3.1 re gaps in information of meters vs actual registered stands and potential electricity customers. Billing has been identified as a problem, and as a result, collection will be too on customers that are supposed to receive a bill but are not.

4.3.3.7 Investigate necessity of tariff study and review

Reference information received in this regard consist of:

- Schedule of tariffs for 2021-2022
- Draft 2022-23 tariff policy as obtained from the MLM website.

Observations:

- The policy is drawn up in accordance with the principles of the Municipal Systems Act (MSA)
- The section about "The customer must pay principle" suggests that not all customers are metered and that plans are being developed to address this. It is not clear from the document whether this relates to electricity, water, or both.
- The mentioned tariff schedule is on the MLM website as we believe it should be so that consumers can be informed. It is however a .pdf version of the Excel document mentioned above and only contain the various charges. No descriptions to explain what the various tariffs are for. We believe it important that where there are different categories of charges, explanations be given for those. The below extract from the schedule for instance is not clear on which of the three tariffs listed is for domestic consumers, which is for churches and which for old age homes.

- The document also lists all tariffs in one document. We believe a better practice is to have a separate document for each type of service. That way consumers can access the tariff documents that are applicable to them.
- Although this project is about non-revenue electricity, the absence of charges for water consumption was noted.
- A comparison of tariffs with one of the metros in the country shows that MLM charges considerably for instance per kWh for business customers (R2,08 compared to R2,68, but significantly more for monthly fixed charges (R 444.54 for single phase compared to R 200).

Conclusion:

- As with our recommendation for KDM, it is recommended that a tariff study and review be considered for iLembe and all its member municipalities for the purpose of arriving at a unified tariff policy and charge's structure.

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

An Excel file "Debtors Ageing Per Service1- FEBRUARY 2022" was received in this regard. Below Pivot table is an extract from this file.

Serivce	180 Days	150 Days	120 days	90 Days	60 Days	30 Days	Current	Balance
Interest	33,357,090.92	253,363.67	559,281.53	289,875.81	293,709.31	291,354.48	294,085.75	35,338,761.47
Property Rates	68,808,857.16	14,363,124.28	1,103,553.85	1,133,521.49	2,431,278.89	1,491,906.77	2,213,725.10	91,545,967.54
OTHER	1,075,306.40	0.01	-282.20	-1,601.36	-40,869.00	215,514.43	97,331.95	1,345,400.23
Electricity Basic	1,155,584.20	42,192.00	41,930.96	44,372.96	47,686.81	71,459.68	96,295.74	1,499,522.35
Refuse	46,212,305.05	767,631.86	817,794.76	823,855.18	840,903.67	889,413.77	990,349.50	51,342,253.79
Electricity Consumption	1,871,061.61	76,531.90	103,228.42	54,980.52	220,676.01	431,334.67	3,616,372.17	6,374,185.30
Rent	155,651.83	8,382.80	7,552.14	7,552.14	7,552.14	7,552.14	9,182.17	203,425.36
IntElec	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deposit	-3,546.98	0.00	0.00	0.00	0.00	0.00	0.00	-3,546.98
IntRates	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grand Total	152,632,310.19	15,511,226.52	2,633,059.46	2,352,556.74	3,800,937.83	3,398,535.94	7,317,342.38	187,645,969.06
% of book	81.34%	8.27%	1.40%	1.25%	2.03%	1.81%	3.90%	

The table below indicates the top 25 debtors for the municipality.

Account	Name	Physical1	GroupDescription	0-30	31-60	61-90	91-120	121-150	151-180	181+	Balance
2103333	UMGENI WATER	LOT 3333	Businesses: Municipal Licensed Area	R 2,608,955.45	R -	R -	R -	R -	R -	R -	R 2,608,955.45
9901721	PROVINCIAL GOVERNM OF PROV OF KZN-NAT R S A	22/11 FRYE ROAD	National: Transport	R -	R -	R -	R -	R -	R 636,480.00	R 1,427,422.00	R 2,063,902.00
6600020	UBA CO OP SUGAR MILLING CO. LTD	FARM NEWARK NO 2621	Businesses: Eskom Licensed Area	R 1,628.00	R 1,628.00	R 1,628.00	R 1,628.00	R 1,628.00	R 1,628.00	R 2,025,611.29	R 2,035,379.29
1068200	SUNDUMBILI POLY CLINIC	000682 SUNDUMBILI	Provincial: Health	R 8,293.16	R 8,293.16	R 7,654.35	R 11,838.27	R 15,499.20	R 15,905.97	R 1,641,719.60	R 1,709,203.71
6611201	DEPARTMENT OF EDUCATION KWAZULU-NATAL;			R 48,906.00	R 48,906.00	R 48,906.00	R 48,906.00	R 48,906.00	R 48,906.00	R 1,373,934.33	R 1,667,370.33
ZZZZZ	Direct deposits		Households: Non-indigents - Municpal Licensed Area	R 1,909.59	R 1,906.42	R 1,903.24	R 1,900.08	R 3,790.68	R 2,002.78	R 1,126,950.31	R 1,140,363.10
80021	NATIONAL GVT OF RSA	PORT 12 OF FARM CARLTON NO 6069	Businesses: Eskom Licensed Area	R 30,300.00	R 30,300.00	R 30,300.00	R 30,300.00	R 30,300.00	R 30,300.00	R 887,593.59	R 1,069,393.59
8077777	DEPARTMENT OF PUBLIC WORKS	NATIONAL ROAD CORRIDOR - PSI	National: Public Works	R -	R -	R -	R -	R -	R -	R 1,040,330.74	R 1,040,330.74
1100500	MANDES TRUST-TRUSTEES	001005 SUNDUMBILI	Households: Non-indigents - Eskom Licensed Area	R 26,500.00	R 26,500.00	R 26,500.00	R 26,500.00	R 26,500.00	R 26,500.00	R 743,149.42	R 902,149.42
6600811	REPUBLIC OF SOUTH AFRICA - ZN 06626	LOT 81 TUGELA	National: Public Service and Administration	R -	R -	R -	R -	R -	R 449,280.00	R 403,200.00	R 852,480.00
80373	ISITHEBE INDUSTRIAL SCHOOL	FARM RESERVE NO 21 NO 16882	Provincial: Education	R -	R -	R -	R -	R -	R -	R 816,964.55	R 816,964.55
80372	SUNDUMBILI POLY CLINIC	PORT 1 OF FARM RESERVE NO 21 NO 16882	Provincial: Health	R -	R -	R -	R -	R -	R 370,000.00	R 376,817.31	R 746,817.31
80005	NATIONAL GVT OF THE RSA	FARM ANNEXE RES NO 8 NO 14264	Other: Eskom Licensed Area	R 5,087.50	R 5,087.50	R 5,087.50	R 5,087.50	R 5,087.50	R 5,087.50	R 715,781.62	R 746,306.62
80372	SUNDUMBILI POLY CLINIC	PORT 1 OF FARM RESERVE NO 21 NO 16882	Provincial: Health	R -	R -	R -	R -	R -	R -	R 702,747.43	R 702,747.43
8088888	PUBLIC W/DEPT	PROVINCIAL ROAD CORRIDOR-PSI	National: Public Works	R -	R -	R -	R -	R -	R -	R 667,560.31	R 667,560.31
6600020	UBA CO OP SUGAR MILLING CO. LTD	FARM NEWARK NO 2621	Businesses: Eskom Licensed Area	R 4,292.29	R 4,282.44	R 4,272.61	R 4,262.78	R 8,496.20	R 4,233.46	R 616,810.32	R 646,650.10
80357	THUKELA HIGH SCHOOL- zn 06566	PTN 1 FARM RES NO 21 NO 16882	Provincial: Education	R -	R -	R -	R -	R -	R -	R 630,639.28	R 630,639.28
1133100	SUNDUMBILI POLICE STATION	001331 SUNDUMBILI	National: Police	R 8,922.90	R 8,922.90	R 9,305.10	R 8,922.90	R 8,922.90	R 8,922.90	R 480,985.20	R 534,904.80
1000027	MACAMBINI TRAINING CENTRE		Government	R -	R -	R -	R -	R -	R 273,780.00	R 260,910.00	R 534,690.00
1073800	MATHONSI	000738 SUNDUMBILI	Households: Non-indigents - Eskom Licensed Area	R -	R -	R 282.24	R -	R -	R -	R 523,139.44	R 523,421.68
1000039	BUILD IT	RESERVE NO 21	business	R -	R -	R -	R -	R -	R 157,500.00	R 354,899.41	R 512,399.41
80173	R S A	P/1 FARM LOT H NO 1671	National: Transport	R -	R -	R -	R -	R -	R -	R 424,758.86	R 424,758.86
1057600	IMBEWENHLE LP SCHOOL	000576 SUNDUMBILI	Provincial: Education	R 14,742.00	R 14,742.00	R 14,742.00	R 14,742.00	R 14,742.00	R 14,742.00	R 330,992.45	R 419,444.45
80592	SUNDUMBILI HIGH SCHOOL	PORT 8 OF FARM RESERVE 21 NO 16882	Provincial: Education	R -	R -	R -	R -	R -	R -	R 416,989.95	R 416,989.95
1060800	SUNDUMBILI H P SCHOOL	000608 SUNDUMBILI	Provincial: Education	R -	R -	R -	R -	R -	R 91,260.00	R 321,131.65	R 412,391.65
80124	HURPAUL	PORT 24 FARM LOT 41A NO 2617	Businesses: Eskom Licensed Area	R 31.45	R 31.45	R 31.45	R 31.45	R 31.45	R 31.45	R 409,083.01	R 409,271.71

Observations:

- The total debtor's book is R 187m of which R 152 m, (81%) are 180 days or older. This indicates a real challenge with collection and will negatively affect MLM, not just wrt collecting charges for electricity consumption, but cash collections in general and the resultant impact on cashflow for the entity.
- Although Umgeni water reflects as the biggest debtor, it is also clear that they keep their account up to date.
- The top 25 debtors are almost all government institutions (provincial and national)
- Add to this the concern that many electricity meters may not even be in the system, then it is clear that MLM have a huge challenge in this regard.

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 11: 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	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 MLM Electrical department, through Mr Selby Msweli. The following items were discussed:

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

There are currently no programmes or initiatives in place within MLM regarding any community awareness of the dangers of electricity theft and illegal connections. The only community awareness programmes in place are where networks are supplied directly by Eskom within the municipality, and therefore do not form part of this study.

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

5 STATUS QUO REPORT SUMMARY & CONCLUSION

5.1 Situational Analysis

5.1.1 Key Network Installations

The MLM network data has been derived from previous studies and assessments which include Electricity Master Plans, 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,

- GIS layers of all the 11kV and 6.6kV infrastructure such as substations, switching substations, cables, overhead lines, mini substations, ring main units and transformers
- GIS Layers of Eskom bulk infrastructure
- Asset Register

The data available is a fair representation of the current 11kV and 6.6kV distribution system, however it must be noted that there are currently no single line drawings of the MLM electrical networks. It would be beneficial to MLM to have these developed. The GIS data currently available seems to be representative of all the current MV electrical assets.

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 MLM 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, primarily the Electricity Master Plan.
Infrastructure constraints were identified as the bulk of the electricity network was developed many years ago and has since deteriorated or become obsolete through time, technological changes and/or expected useful life
The following can be noted,

- The 11/6.6kV satellite switching substations are categorised as good as they have been refurbished.
- With respect to 11kV minisub stations around 80% are considered to be in adequate condition with 20% falling in the poor category.
- All of the 6.6kV miniature substations are categorised as marginal indicating equipment has reached useful life with defects affecting functionality.

There is a general need for routine maintenance and a requirement to replace the 6.6kV equipment with 11kV equipment which is considered a more appropriate system voltage level.

5.1.3 General Assessment of Metering & Meter Reading for bulk purchases

- No MLM check meters exist and reliance is placed completely on the accuracy of Eskom measuring equipment.
- Umgeni water as a single customer has more than double the energy consumption of the whole of the rest of MLM. See comparative table below.
- Mandeni intake point has a monthly Network Demand Charge / kVA as well as an Energy Demand Charge / kVA. Refer section 4.1.3.3 in this regard.
- Mandeni Rural POS supplies the rest of MLM, excluding customers supplied directly by Eskom.

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

Only one LPU customer exists for MLM in the form of Umgeni water. The Umgeni Water intake point only supplies Umgeni Water as a consumer currently. A Three-party agreement exist between Eskom, MLM and Umgeni water in this regard.

- Sole reliance is placed on ESKOM for accuracy of readings to Umgeni water.
- MLM only charges a 10% management fee on top of the Eskom invoice to Umgeni water.
- This three-party agreement may lead to confusion as to who are customers of whom and who supplies whom. Strictly one could argue that Eskom supplies Umgeni water, but then Eskom invoices MLM, and Umgeni water gets invoiced by MLM as its customer.

5.1.5 Roles & Responsibilities

Electricity Provision
The provision of electrical services has been assessed using the current organogram and the electricity department is a sub-department of the Technical Services & Infrastructure Development Department. There are currently vacancies available for artisans and the MLM AMP 2019 has identified a need for a General Machine Regulations 2(1) responsible person. The EMP 2019 identified a need for an updated structure within the electrical department which expands on the current structure to introduce 3 streams, Municipal Buildings, Reticulation System and Street Lighting

Finance Department
The organogram indicates a total complement for the Revenue department (including meter reading) of 8 people and for credit control (debt management) a total of four. No vacancies exist. It is not clear though whether the staff complement is sufficient to manage the workload.

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

Bylaws and Policies
MLM 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. There is however a general lack of standard operating procedures.

Tariff Setting

The Tariff setting is aligned to the Tariff Policy, Municipal Systems Act and NERSA Tariff guidelines. Electricity falls under the trading service category and Council's pricing strategy for this service is to recover the full cost of rendering the service to the community. The policy acknowledges that a minimum amount of basic services such as electricity must be free for poor households and tariffs kept at affordable levels. Tariffs are reviewed during the preparation of the annual budget in accordance with the Tariff Policy and the tariff determination process is conducted in line with the MSA. Considering that the utility has not conducted a detailed tariff study in recent years may indicate that the current tariffs may not be completely cost reflective with a need for a study in the near future.

Asset Management & Planning
MLM currently does not formally implement a lot of asset management systems and have a relatively low asset management practice maturity, especially in the field of physical asset management within the utility. These poor asset management practices are related to skill challenges and constrained budgets. The current practise was assessed to be predominantly "aware" of good practices and the municipality aims to move towards a level of competence. 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.

Budget for Operations & maintenance
MLM have identified electrical infrastructure repairs and maintenance budgets for financial years 2022/2023 and 2023/24 in the order of R3.3 million per financial year. Considering that there is a need for additional maintenance on existing failing infrastructure, the current budgets need to be reassessed to meet the current network needs.
The actual expense for the year is however much greater and shown in section 4.1.3.6.5 within Table 8 of this report. The total expense for the last financial year was R38.4 million with electricity purchase at R31.2 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 6% range for the 2020 and 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 current systems still incorporate paper-based processes with a need for automated processes. The following information systems have been identified,

ESRI ArcGIS Software: MLM utilise ArcGIS within their Economic Planning and Development department. The software is a standalone is fully licensed package with maintenance plan. This software package is not linked to any other systems.

Sage Evolution: MDM utilise Sage for financial management and billing as well as host and update their asset register. Sage is a versatile tool that provides the utilities current requirements and is mSCAO compliant. The Sage package has an interface to MLM payroll software.

PayDay: MLM utilise PayDay software for payroll which has an interface to Sage.
Microsoft: Excel, Projects etc. are used on a day-to-day basis, also typically used for asset planning and creation then transferred to Sage.

AMS360: MLM utilise the AMS360 asset management software which is a Web-based solution and is mSCOA compliant. This is an independent tool utilised to capture new assets, host existing assets and to verify assets. The information captured within this tool is transferred to Sage and hosted within this platform, there is no direct interface.

SCADA: SCADA functionality currently does not exist in MLM.

Asset Management Information Systems (AMIS): An AMIS scoping 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 extent of technical losses studies compiled for the MLM electrical networks are limited to one independent assessment conducted as part of the 2019 EMP.
As part of the 2019 Master Plan Revision, technical losses for the MLM 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 estimate of the MV losses were in the 2% range and 6% on the LV networks which is considered relatively high for LV networks in Mandeni supply area. Considering the extent of networks, demand of the current system and comparison to the total losses of 8.47% in 2021, a benchmark of 3-4% would be considered more likely for technical losses. The losses on the MV network can be mostly attributed to the aged 6.6kV network.

5.3 Non-Technical Losses

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

Based on a comparative analysis between the information received on billing and prepaid meters purchasing history vs the valuation roll, a large gap was identified between customers that seem to have actual meters linked to their accounts, and potential electricity customers.

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

It was confirmed by MLM that no SOP's exist and that they are experiencing challenges in this regard. This was further supported regarding information that meters have been found in the field during an audit, but the meters are not in the financial system.

5.3.3 Assess adequacy, effectiveness & efficiency of financial systems

Financial systems in use consist of:

- Main Financial management system
    - Sage Pastel system is in use
    - System is mSCOA compliant

- Supplementary systems
    - Conlog Prepaid vending system
        - System is STS compliant
        - No interface between Sage Pastel and Conlog systems
        - Prepaid meters info only resides in prepaid 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

As mentioned under 5.3.1, large gaps have been identified between actual customers with meters and potential customers with electricity meters.

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

The above report was part of phase 1 of the establishment of a regional customer care centre and recommend a single platform Customer Care system for whole of iLembe. Our views support this recommendation.

Phase 2 of this project is currently under way, a demo on the system was planned for June 2022. Phase 2 to be implemented on successful completion of Memorandum of Agreements with municipalities.

5.3.6 Assess billing & revenue collection re electrical services provision

Gaps in billing and revenue collection has been identified as a challenge, resulting from indications that not all electricity meters are in the financial system.

5.3.7 Investigate necessity of tariff study and review

A tariff study and review for the whole of iLembe is 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 supported from our point of view.

Currently draft ToR are being finalised. Project will also only launch post signing of MoA's.

5.3.9 Review of Debt management

A debtor's age report for February 2022 was received.

- This report shows that 81% of the debtor book is 180 days or older.
- Although Umgeni water reflects as the biggest debtor, it is also clear that they keep their account up to date.
- The top 25 debtors are almost all government institutions (provincial and national)
- The fact that there seem to be many electricity meters that are not in the system, further compounds this challenge.

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

Eskom invoicing summary

Mandeni Intake Point Eskom Billing summary (3 years)

Intake Point		Mandeni
Premise ID		6812103328

		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		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	*3,500*
Utilized Capacity		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	*3,500*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		0	0.00											0.00
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
HIGH SEASON ENERGY CONSUMPTION STD kWh		763,523.88	800,094.48	473,711.00									324,069.00	2,361,398.36
LOW SEASON ENERGY CONSUMPTION STD kWh				336,103.00	731,608.00	825,360.00	783,995.20	844,878.60	845,056.00	799,653.44	773,686.12	739,591.88	438,763.00	
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		0.00	0.00											0.00
LOW SEASON ENERGY CONSUMPTION PEAK kWh				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
ENERGY CONSUMPTION ALL kWh		763,523.88	800,094.48	809,814.00	731,608.00	825,360.00	783,995.20	844,878.60	845,056.00	799,653.44	773,686.12	739,591.88	762,832.00	9,480,093.60
DEMAND CONSUMPTION - OFF PEAK		1,550.53	1,641.89	1,640.72	1,858.08	1,592.60	1,746.37	1,877.48	1,812.13	1,641.34	2,021.24	1,589.67	1,781.23	20,753.28
DEMAND CONSUMPTION - STD		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
DEMAND CONSUMPTION - PEAK		1,771.61	1,865.12	1,810.92	1,818.26	1,667.53	2,068.09	2,073.20	1,874.93	1,871.37	2,085.84	1,710.67	1,735.23	22,352.77
DEMAND READING - KW/KVA		1,771.61	1,865.12	1,810.92	1,818.26	1,667.53	2,068.09	2,073.20	1,874.93	1,871.37	2,085.84	1,710.67	1,735.23	22,352.77
REACTIVE ENERGY - OFF PEAK		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
REACTIVE ENERGY - STD		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
REACTIVE ENERGY - PEAK		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
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		62.00	59.00	62.00	62.00	67.00	55.00	55.00	65.00	67.00	52.00	63.00	60.00	*60.75*
CHARGES DETAILS														
Administration Charge per day for monthdays	R 85.8600	R 2,575.80	R 2,661.66	R 2,661.66	R 2,404.08	R 2,747.52	R 2,575.80	R 2,747.52	R 2,661.66	R 2,404.08	R 2,661.66	R 2,575.80	R 2,661.66	R 31,338.90
TX Network Capacity Charge /kVA	R 7.7100	R 25,933.83	R 26,985.00	R 26,985.00	R 26,985.00	R 26,985.00	R 26,985.00	R 26,985.00	R 26,985.00	R 26,985.00	R 26,985.00	R 26,985.00	R 26,985.00	R 322,768.83
Network Capacity Charge /kVA	R 15.2900	R 51,452.33	R 53,515.00	R 53,515.00	R 53,515.00	R 53,515.00	R 53,515.00	R 53,515.00	R 53,515.00	R 53,515.00	R 53,515.00	R 53,515.00	R 53,515.00	R 640,117.33
Network Demand Charge /kVA	R 28.9900	R 49,371.51	R 54,069.83	R 52,498.57	R 52,711.36	R 48,341.69	R 59,953.93	R 60,102.07	R 54,354.22	R 54,251.02	R 60,468.50	R 49,592.32	R 50,304.32	R 646,019.34
Energy Demand Charge / kVA (High season R 216.41, Low Season R 30.22)	R 30.2200	R 368,578.45	R 403,630.62	R 250,506.53	R 54,947.82	R 50,392.76	R 62,497.68	R 62,652.10	R 56,660.38	R 56,552.80	R 63,034.08	R 51,696.45	R 187,925.93	R 1,669,075.61
Ancillary Service Charge /kWh	R 0.0038	R 2,772.69	R 3,040.36	R 3,077.29	R 2,780.11	R 3,136.37	R 2,979.18	R 3,210.54	R 3,211.21	R 3,038.68	R 2,940.01	R 2,810.45	R 2,898.76	R 35,895.65
High Season Off Peak Energy Charge /kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Low Season Off Peak Energy Charge /kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
High Season Peak Energy Charge / kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Low Season Peak Energy Charge / kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
High Season Standard Energy Charge /kWh	R 0.7167	R 526,239.94	R 573,427.37	R 339,508.67	R -	R -	R -	R -	R -	R -	R -	R -	R 232,260.25	R 1,671,436.24
Low Season Standard Energy Charge /kWh	R 0.5590	R -	R -	R 187,881.58	R 408,968.87	R 461,376.24	R 438,253.32	R 472,287.14	R 472,386.30	R 447,006.27	R 432,490.54	R 413,431.86	R 245,268.52	R 3,979,350.64
Electrification and Rural Subsidy /kWh	R 0.0742	R 54,465.62	R 59,366.97	R 60,088.20	R 54,285.31	R 61,241.71	R 58,172.43	R 62,690.02	R 62,703.16	R 59,334.25	R 57,407.50	R 54,877.73	R 56,602.13	R 701,235.04
High Season Reactive energy Charge /kvarh	R 0.1656	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Service Charge		R 5,493.27	R 5,904.57	R 5,904.57	R 5,333.16	R 6,095.04	R 5,714.10	R 6,095.04	R 5,904.57	R 5,333.16	R 5,904.57	R 5,714.10	R 5,904.57	R 69,300.72
Rebilled adjustments				R 147,756.36										
Total Charges		R 1,086,883.44	R 1,182,601.38	R 1,130,383.43	R 661,930.71	R 713,831.33	R 710,646.44	R 750,284.43	R 738,381.51	R 708,420.26	R 705,406.87	R 661,198.71	R 864,326.14	R 9,766,538.29
Consumption Charges		R 526,239.94	R 573,427.37	R 527,390.25	R 408,968.87	R 461,376.24	R 438,253.32	R 472,287.14	R 472,386.30	R 447,006.27	R 432,490.54	R 413,431.86	R 477,528.77	R 5,650,786.87
Ancillary Charges		R 560,643.50	R 609,174.01	R 602,993.18	R 252,961.84	R 252,455.09	R 272,393.12	R 277,997.29	R 265,995.20	R 261,413.99	R 272,916.32	R 247,766.85	R 386,797.37	R 4,115,751.42
Consumption Charges as % of Total Charges		48.42%	48.49%	46.66%	61.78%	64.63%	61.67%	62.95%	63.98%	63.10%	61.31%	62.53%	55.25%	58.40%
Ancillary Charges as % of Total Charges		51.58%	51.51%	53.34%	38.22%	35.37%	38.33%	37.05%	36.02%	36.90%	38.69%	37.47%	44.75%	42.14%

Intake Point		Mandeni												
Premise ID		6812103328												
		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		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	*3,500*
Utilized Capacity		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	*3,500*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH			0.00										0.00	0.00
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HIGH SEASON ENERGY CONSUMPTION STD kWh		740,368.68	791,777.00	457,874.00									327,160.00	2,317,179.68
LOW SEASON ENERGY CONSUMPTION STD kWh				332,264.00	771,831.20	803,460.88	773,834.16	837,183.60	854,857.72	785,835.64	787,558.20	730,204.04	438,631.00	
HIGH SEASON ENERGY CONSUMPTION PEAK kWh			0.00										0.00	0.00
LOW SEASON ENERGY CONSUMPTION PEAK kWh				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
ENERGY CONSUMPTION ALL kWh		740,368.68	791,777.00	790,138.00	771,831.20	803,460.88	773,834.16	837,183.60	854,857.72	785,835.64	787,558.20	730,204.04	765,791.00	9,432,840.12
DEMAND CONSUMPTION - OFF PEAK		1,588.84	1,671.81	1,671.81	1,657.31	1,661.41	1,625.80	1,811.58	1,749.01	1,840.97	1,684.45	1,716.01	1,724.38	20,403.38
DEMAND CONSUMPTION - STD		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
DEMAND CONSUMPTION - PEAK		1,822.81	1,791.67	1,744.12	1,723.96	1,800.17	1,840.14	1,900.11	1,775.90	1,817.98	1,706.24	1,746.38	1,852.44	21,521.92
DEMAND READING - KW/KVA		1,822.81	1,791.67	1,744.12	1,723.96	1,800.17	1,840.14	1,900.11	1,775.90	1,817.98	1,706.24	1,746.38	1,852.44	21,521.92
REACTIVE ENERGY - OFF PEAK		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
REACTIVE ENERGY - STD		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
REACTIVE ENERGY - PEAK		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
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		58.00	58.00	63.00	64.00	62.00	62.00	63.00	69.00	65.00	65.00	60.00	58.00	*62.25*
CHARGES DETAILS														
Administration Charge per day for monthdays	R 91.6700	R 2,750.10	R 3,077.68	R 3,077.68	R 2,978.40	R 3,077.68	R 2,978.40	R 2,841.77	R 3,077.68	R 2,879.12	R 3,077.68	R 2,978.40	R 3,077.68	R 35,872.27
TX Network Capacity Charge /kVA	R 8.9200	R 28,820.17	R 31,220.00	R 31,220.00	R 31,220.00	R 31,220.00	R 31,220.00	R 31,220.00	R 31,220.00	R 31,220.00	R 31,220.00	R 31,220.00	R 31,220.00	R 372,240.17
Network Capacity Charge /kVA	R 17.6800	R 30,325.17	R 61,880.00	R 61,880.00	R 61,880.00	R 61,880.00	R 61,880.00	R 61,880.00	R 61,880.00	R 61,880.00	R 61,880.00	R 61,880.00	R 61,880.00	R 711,005.17
Network Demand Charge /kVA	R 33.5200	R 56,691.44	R 60,056.78	R 58,462.90	R 57,787.14	R 60,341.70	R 61,681.49	R 63,691.69	R 59,528.17	R 60,938.69	R 57,193.16	R 58,538.66	R 62,093.79	R 717,005.61
Energy Demand Charge	R 34.9400	R 421,188.20	R 448,329.58	R 278,966.93	R 60,235.16	R 62,897.94	R 64,294.49	R 66,389.84	R 62,049.95	R 63,520.22	R 59,616.03	R 61,018.52	R 231,967.91	R 1,880,474.77
Ancillary Service Charge /kWh	R 0.0044	R 3,012.04	R 3,483.82	R 3,476.61	R 3,396.06	R 3,535.23	R 3,404.87	R 3,683.61	R 3,761.38	R 3,457.68	R 3,465.26	R 3,212.90	R 3,369.48	R 41,258.92
High Season Off Peak Energy Charge /kWh		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Low Season Off Peak Energy Charge /kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
High Season Peak Energy Charge / kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Low Season Peak Energy Charge / kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
High Season Standard Energy Charge /kWh	R 0.8287	R 567,700.95	R 656,145.60	R 379,440.18	R -	R -	R -	R -	R -	R -	R -	R -	R 271,117.49	R 1,874,404.23
Low Season Standard Energy Charge /kWh	R 0.6464	R -	R -	R 214,775.45	R 498,911.69	R 519,357.11	R 500,206.40	R 541,155.48	R 552,580.03	R 507,964.16	R 509,077.62	R 472,003.89	R 283,531.08	R 4,599,562.91
Electrification and Rural Subsidy /kWh	R 0.0858	R 58,775.66	R 67,934.47	R 67,793.84	R 66,223.10	R 68,936.95	R 66,394.96	R 71,830.39	R 73,346.82	R 67,424.73	R 67,572.48	R 62,651.50	R 65,704.87	R 804,589.76
High Season Reactive energy Charge /kvarh		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 7,063.20	R -	R 7,063.20
Service charge		R 6,101.11	R 6,827.44	R 6,827.44	R 6,607.20	R 6,827.44	R 6,607.20	R 6,607.20	R 6,827.44	R 6,386.96	R 6,827.44	R 6,607.20	R 6,827.44	R 79,881.51
Billed adjustments			R 26,814.67											R 26,814.67
Total Charges		R 1,175,364.84	R 1,365,770.04	R 1,105,921.03	R 789,238.75	R 818,074.05	R 798,667.81	R 849,299.98	R 854,271.46	R 805,671.56	R 799,929.66	R 767,174.27	R 1,020,789.74	R 11,150,173.17
Consumption Charges		R 567,700.95	R 656,145.60	R 594,215.63	R 498,911.69	R 519,357.11	R 500,206.40	R 541,155.48	R 552,580.03	R 507,964.16	R 509,077.62	R 472,003.89	R 554,648.57	R 6,473,967.13
Ancillary Charges		R 607,663.89	R 709,624.44	R 511,705.40	R 290,327.06	R 298,716.94	R 298,461.41	R 308,144.50	R 301,691.43	R 297,707.40	R 290,852.04	R 295,170.38	R 466,141.17	R 4,676,206.04
Consumption Charges as % of Total Charges		48.30%	48.04%	53.73%	63.21%	63.49%	62.63%	63.72%	64.68%	63.05%	63.64%	61.52%	54.34%	59.20%
Ancillary Charges as % of Total Charges		51.70%	60.37%	43.54%	24.70%	25.41%	25.39%	26.22%	25.67%	25.33%	24.75%	25.11%	39.66%	33.15%

Intake Point		Mandeni												
Premise ID		6812103328												
		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	
Month Days		31	31	30	31	30	31	31	28	31	30	31	30	
Notified Max Demand		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	*3,500*
Utilized Capacity		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	*3,500*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		0	0.00											0.00
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
HIGH SEASON ENERGY CONSUMPTION STD kWh		774,319.80	809,399.56	464,082.00									754,188.60	2,801,989.96
LOW SEASON ENERGY CONSUMPTION STD kWh				323,614.00	772,033.72	792,463.72	786,339.48	837,183.60	854,857.72	763,606.24	793,366.08	730,204.04		
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		0.00	0.00											0.00
LOW SEASON ENERGY CONSUMPTION PEAK kWh				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
ENERGY CONSUMPTION ALL kWh		774,319.80	809,399.56	787,696.00	772,033.72	792,463.72	786,339.48	837,183.60	854,857.72	763,606.24	793,366.08	730,204.04	754,188.60	9,455,658.56
DEMAND CONSUMPTION - OFF PEAK		1,618.59	1,733.77	2,022.93	1,724.79	1,662.70	1,564.41	1,811.58	1,749.01	1,745.53	1,796.26	1,716.01	1,892.46	21,038.04
DEMAND CONSUMPTION - STD		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
DEMAND CONSUMPTION - PEAK		2,080.17	2,006.99	2,055.62	1,794.72	1,778.18	1,668.75	1,900.11	1,775.90	1,875.78	1,782.40	1,746.38	1,940.59	22,355.59
DEMAND READING - KW/KVA		2,080.17	2,006.99	2,055.62	1,794.72	1,778.18	1,668.75	1,900.11	1,775.90	1,875.78	1,796.26	1,746.38	1,940.59	22,369.45
REACTIVE ENERGY - OFF PEAK		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
REACTIVE ENERGY - STD		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
REACTIVE ENERGY - PEAK		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
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		54.00	55.00	53.00	62.00	64.00	70.00	63.00	69.00	64.00	63.00	60.00	53.00	*60.83333333*
														3290.03
Administration Charge per day for monthdays	R 106.1300	R 3,067.50	R 3,290.03	R 3,290.03	R 3,183.90	R 3,290.03	R 3,183.90	R 3,290.03	R 3,290.03	R 2,971.64	R 3,290.03	R 3,183.90	R 3,290.03	R 38,621.05
TX Network Capacity Charge /kVA	R 9.5400	R 32,150.33	R 33,390.00	R 33,390.00	R 33,390.00	R 33,390.00	R 33,390.00	R 33,390.00	R 33,390.00	R 33,390.00	R 33,390.00	R 33,390.00	R 33,390.00	R 399,440.33
Network Capacity Charge /kVA	R 18.9000	R 63,730.33	R 66,150.00	R 66,150.00	R 66,150.00	R 66,150.00	R 66,150.00	R 66,150.00	R 66,150.00	R 66,150.00	R 66,150.00	R 66,150.00	R 66,150.00	R 791,380.33
Network Demand Charge /kVA	R 35.8300	R 68,083.50	R 71,910.45	R 73,652.86	R 64,304.82	R 63,712.19	R 59,791.31	R 68,080.94	R 63,630.50	R 67,209.20	R 63,863.39	R 62,572.80	R 69,531.70	R 796,343.66
Energy Demand Charge	R 37.3500	R 523,202.56	R 536,869.83	R 351,461.18	R 67,032.79	R 66,415.02	R 62,327.81	R 70,969.11	R 66,329.87	R 70,060.38	R 66,572.64	R 65,227.29	R 259,777.48	R 2,206,245.97
Ancillary Service Charge /kWh	R 0.0047	R 3,507.62	R 3,804.18	R 3,702.17	R 3,628.56	R 3,724.58	R 3,695.79	R 3,934.76	R 4,017.83	R 3,588.95	R 3,728.82	R 3,431.96	R 3,544.69	R 44,309.92
High Season Off Peak Energy Charge /kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Low Season Off Peak Energy Charge /kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
High Season Peak Energy Charge / kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Low Season Peak Energy Charge / kWh	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
High Season Standard Energy Charge /kWh	R 0.8859	R 660,862.32	R 717,047.46	R 411,130.24	R -	R -	R -	R -	R -	R -	R -	R -	R 282,186.61	R 2,071,226.63
Low Season Standard Energy Charge /kWh	R 0.6910	R -	R -	R 223,617.27	R 533,475.30	R 547,592.43	R 543,360.58	R 578,493.87	R 590,706.68	R 527,651.91	R 548,215.96	R 504,570.99	R 301,039.68	R 4,898,724.68
Electrification and Rural Subsidy /kWh	R 0.0917	R 68,415.35	R 74,221.98	R 72,231.72	R 70,795.52	R 72,668.95	R 72,107.29	R 76,769.77	R 78,390.48	R 70,022.67	R 72,751.66	R 66,959.71	R 69,159.13	R 864,494.23
High Season Reactive energy Charge /kvarh	R 0.1656	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
Service Charge		R 6,804.80	R 7,298.64	R 7,298.64	R 7,063.20	R 7,298.64	R 7,063.20	R 7,298.64	R 7,298.84	R 6,592.32	R 7,298.84	R 7,063.20	R 7,298.84	
Total Charges		**R 1,429,824.31**	**R 1,513,982.57**	**R 1,245,924.13**	**R 849,024.09**	**R 864,241.84**	**R 851,069.89**	**R 908,377.13**	**R 913,204.23**	**R 847,637.07**	**R 865,261.35**	**R 812,549.85**	**R 1,095,368.16**	**R 12,110,786.80**
Consumption Charges		R 660,862.32	R 717,047.46	R 634,747.52	R 533,475.30	R 547,592.43	R 543,360.58	R 578,493.87	R 590,706.68	R 527,651.91	R 548,215.96	R 504,570.99	R 583,226.29	R 6,969,951.32
Ancillary Charges		R 768,961.99	R 796,935.11	R 611,176.61	R 315,548.79	R 316,649.41	R 307,709.30	R 329,883.26	R 322,497.54	R 319,985.16	R 317,045.38	R 307,978.85	R 512,141.87	R 7,834,445.54
Consumption Charges as % of Total Charges		46.22%	47.36%	50.95%	62.83%	63.36%	63.84%	63.68%	64.69%	62.25%	63.36%	62.10%	53.24%	**58.66%**
Ancillary Charges as % of Total Charges		53.78%	55.74%	42.74%	22.07%	22.15%	21.52%	23.07%	22.56%	22.38%	22.17%	21.54%	35.82%	**30.46%**

Umgeni Intake Point Eskom Billing summary (3 years)

Intake Point		LOWER THUKELA SAPPI
Premise ID		6274494579

		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		10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	*10,000*
Utilized Capacity		10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	*10,000.00*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		374,666.46	479,158.74	208,166.00									227,525.00	1,289,516.20
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				161,195.00	369,447.12	432,905.28	468,685.20	576,118.20	400,956.12	417,310.80	489,294.00	558,943.80	260,541.00	
HIGH SEASON ENERGY CONSUMPTION STD kWh		284,822.22	353,575.32	182,341.00									149,649.00	970,387.54
LOW SEASON ENERGY CONSUMPTION STD kWh				125,425.00	289,907.58	310,372.98	400,063.62	304,039.80	325,121.46	313,780.86	369,497.94	337,381.38	234,471.00	
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		124,028.46	95,879.64	64,758.00									61,074.00	345,740.10
LOW SEASON ENERGY CONSUMPTION PEAK kWh				48,435.00	101,164.14	124,544.04	183,673.62	111,139.32	141,654.12	130,147.86	129,678.90	125,795.22	105,426.00	
ENERGY CONSUMPTION ALL kWh		783,517.14	928,613.70	790,320.00	760,518.84	867,822.30	1,052,422.44	991,297.32	867,731.70	861,239.52	988,470.84	1,022,120.40	1,038,686.00	10,952,760.20
DEMAND CONSUMPTION - OFF PEAK		2,447.18	2,446.09	2,407.31	2,424.11	2,546.85	2,571.31	2,546.31	2,632.66	2,595.71	2,599.95	2,583.26	2,617.85	30,418.59
DEMAND CONSUMPTION - STD		2,455.19	2,452.90	2,411.44	2,453.74	2,589.99	2,605.28	2,571.39	2,570.70	2,614.95	2,647.15	2,600.81	2,695.53	30,669.07
DEMAND CONSUMPTION - PEAK		2,435.26	2,429.33	2,377.77	2,387.20	2,563.88	2,586.84	2,577.97	2,648.84	2,555.56	2,618.87	2,608.13	2,715.80	30,505.45
DEMAND READING - KW/KVA		2,455.19	2,452.90	2,411.44	2,453.74	2,589.99	2,605.28	2,577.97	2,648.84	2,614.95	2,647.15	2,608.13	2,715.80	30,781.38
REACTIVE ENERGY - OFF PEAK		64,951.62	86,028.42	63,473.40	64,077.24	178,947.42	216,141.06	261,614.76	196,033.08	195,426.36	224,869.56	254,804.40	269,445.24	2,075,812.56
REACTIVE ENERGY - STD		49,900.50	65,431.44	54,782.40	51,633.36	127,866.60	181,815.84	138,517.38	158,678.04	148,189.68	169,425.36	149,911.50	211,388.52	1,507,540.62
REACTIVE ENERGY - PEAK		21,902.58	15,045.15	19,174.44	17,051.16	50,310.30	80,452.74	51,055.74	67,610.00	60,720.84	61,287.36	55,861.98	89,432.46	589,904.75
EXCESS REACTIVE ENERGY			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65,364.03	65,364.03
LOAD FACTOR		46.00	50.00	44.00	47.00	48.00	56.00	55.00	47.00	52.00	53.00	58.00	54.00	*50.83*
CHARGES DETAILS														
Administration Charge per day for monthdays	R 82.4300	R 2,390.47	R 2,747.52	R 2,661.66	R 2,404.08	R 2,661.66	R 2,747.52	R 2,555.33	R 2,661.66	R 2,404.08	R 2,661.66	R 2,575.80	R 2,661.66	R 31,133.10
TX Network Capacity Charge /kVA	R 7.7100	R 73,993.11	R 77,100.00	R 77,100.00	R 77,100.00	R 77,100.00	R 77,100.00	R 77,100.00	R 77,100.00	R 77,100.00	R 77,100.00	R 77,100.00	R 77,100.00	R 922,093.11
Network Capacity Charge /kVA	R 15.2900	R 146,803.45	R 152,900.00	R 152,900.00	R 152,900.00	R 152,900.00	R 152,900.00	R 152,900.00	R 152,900.00	R 152,900.00	R 152,900.00	R 152,900.00	R 152,900.00	R 1,828,703.45
Network Demand Charge /kVA	R 28.9900	R 68,326.24	R 71,109.57	R 69,907.65	R 71,133.92	R 75,083.81	R 75,527.07	R 74,735.35	R 76,789.87	R 75,807.40	R 76,740.88	R 75,609.69	R 78,731.04	R 889,502.49
Ancillary Service Charge /kWh	R 0.0038	R 2,841.74	R 3,528.73	R 3,003.22	R 2,889.97	R 3,297.72	R 3,999.20	R 3,766.93	R 3,297.38	R 3,272.71	R 3,756.19	R 3,884.06	R 3,947.01	R 41,484.86
High Season Off Peak Energy Charge /kWh	R 0.4909	R 176,727.56	R 235,219.15	R 102,188.69	R -	R -	R -	R -	R -	R -	R -	R -	R 111,692.02	R 625,827.43
Low Season Off Peak Energy Charge /kWh	R 0.4250	R -	R -	R 68,507.88	R 157,014.98	R 183,984.63	R 199,191.13	R 244,850.15	R 170,406.30	R 177,357.18	R 207,949.95	R 237,551.20	R 110,729.93	R 1,757,543.30
High Season Peak Energy Charge / kWh	R 2.9840	R 354,889.69	R 286,105.92	R 193,237.87	R -	R -	R -	R -	R -	R -	R -	R -	R 182,244.82	R 1,016,478.30
Low Season Peak Energy Charge / kWh	R 0.9735	R -	R -	R 47,151.47	R 98,483.29	R 121,243.62	R 178,806.27	R 108,194.13	R 137,900.29	R 126,698.94	R 126,242.41	R 122,461.65	R 102,632.21	R 1,169,814.28
High Season Standard Energy Charge /kWh	R 0.9040	R 247,451.48	R 319,631.80	R 164,836.26	R -	R -	R -	R -	R -	R -	R -	R -	R 135,282.70	R 867,202.24
Low Season Standard Energy Charge /kWh	R 0.6700	R -	R -	R 84,034.75	R 194,238.08	R 207,949.90	R 268,042.63	R 203,706.67	R 217,831.38	R 210,233.18	R 247,563.62	R 226,045.52	R 157,095.57	R 2,016,741.29
Electrification and Rural Subsidy /kWh	R 0.0742	R 55,831.26	R 68,903.16	R 58,641.74	R 56,430.51	R 64,392.39	R 78,089.71	R 73,554.24	R 64,385.71	R 63,904.01	R 73,344.55	R 75,841.30	R 77,070.50	R 810,389.09
High Season Reactive energy Charge /kvarh	R 0.1340	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 8,758.78	R 8,758.78
Service Charge		R 5,302.80	R 6,095.04	R 5,904.57	R 5,333.16	R 5,904.57	R 6,095.04	R 5,904.57	R 5,904.57	R 5,333.16	R 5,904.57	R 5,714.10	R 590.57	R 63,986.72
Total Charges		R 1,134,557.81	R 1,223,340.90	R 1,030,075.76	R 817,927.99	R 894,518.31	R 1,042,498.55	R 947,267.36	R 909,177.15	R 895,010.65	R 974,163.82	R 979,683.32	R 1,201,436.79	R 11,985,671.70
Consumption Charges		R 779,068.73	R 840,956.87	R 659,956.92	R 449,736.34	R 513,178.14	R 646,040.02	R 556,750.94	R 526,137.96	R 514,289.29	R 581,755.98	R 586,058.37	R 799,677.24	R 7,453,606.83
Ancillary Charges		R 355,489.08	R 382,384.02	R 370,118.84	R 368,191.64	R 381,340.17	R 396,458.53	R 390,516.42	R 383,039.19	R 380,721.36	R 392,407.84	R 393,624.95	R 401,759.55	R 4,532,064.88
Consumption Charges as % of Total Charges		68.67%	68.74%	64.07%	54.98%	57.37%	61.97%	58.77%	57.87%	57.46%	59.72%	59.82%	66.56%	61.33%
Ancillary Charges as % of Total Charges		31.33%	31.26%	35.93%	45.02%	42.63%	38.03%	41.23%	42.13%	42.54%	40.28%	40.18%	33.44%	38.67%

Intake Point		LOWER THUKELA SAPPI
Premise ID		6274494579

		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		10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	*10,000*
Utilized Capacity		10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	*10,000.00*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		471,898.28	453,301.56										616,445.34	1,541,645.18
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				400,029.00	401,233.79	429,068.45	462,493.92	630,036.78	543,394.38	572,685.78	643,865.82	487,834.80		
HIGH SEASON ENERGY CONSUMPTION STD kWh		380,044.14	294,863.88										440,149.26	1,115,057.28
LOW SEASON ENERGY CONSUMPTION STD kWh				328,827.84	320,613.53	335,266.49	355,058.94	325,189.38	466,893.24	418,723.50	376,124.40	378,449.28		
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		123,536.46	120,459.78										178,684.62	422,680.86
LOW SEASON ENERGY CONSUMPTION PEAK kWh				125,551.92	101,730.60	147,072.00	158,409.96	123,227.88	189,634.50	171,685.98	144,994.68	145,064.82		
ENERGY CONSUMPTION ALL kWh		975,478.88	868,625.22	854,408.76	823,577.92	911,406.94	975,962.82	1,078,454.04	1,199,922.12	1,163,095.26	1,164,984.90	1,011,348.90	1,235,279.22	12,262,544.98
DEMAND CONSUMPTION - OFF PEAK		2,633.02	2,626.70	2,592.67	2,437.70	2,645.42	2,522.76	2,515.01	2,634.72	2,698.75	2,661.44	2,580.40	2,498.76	31,047.35
DEMAND CONSUMPTION - STD		2,787.35	2,616.27	2,613.30	2,404.28	2,608.60	2,521.17	2,500.07	2,670.09	2,723.81	2,652.81	2,585.24	2,512.56	31,195.55
DEMAND CONSUMPTION - PEAK		2,747.91	2,578.52	2,552.42	2,404.75	2,555.44	2,508.73	2,461.14	2,608.12	2,688.40	2,600.57	2,460.15	2,483.04	30,649.19
DEMAND READING - KW/KVA		2,787.35	2,626.70	2,613.30	2,437.70	2,645.42	2,522.76	2,515.01	2,670.09	2,723.81	2,661.44	2,585.24	2,512.56	31,301.38
REACTIVE ENERGY - OFF PEAK		292,829.40	292,093.02	156,781.56	72,567.89	138,077.63	141,473.82	196,523.76	134,215.02	19,059.74	209,371.20	153,777.54	3,331.26	1,810,101.84
REACTIVE ENERGY - STD		222,554.38	199,878.00	125,494.02	59,221.43	108,044.69	108,791.52	101,353.02	123,280.14	21,960.24	120,914.22	120,704.76	2,102.10	1,314,298.52
REACTIVE ENERGY - PEAK		78,630.42	80,183.04	47,838.95	17,830.49	47,257.31	50,007.48	38,377.20	46,386.44	8,665.50	46,419.30	46,492.62	819.42	508,908.17
EXCESS REACTIVE ENERGY		150,240.60	155,463.94	60,424.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	366,129.43
LOAD FACTOR		53.00	49.00	48.00	49.00	49.00	57.00	61.00	64.00	65.00	62.00	57.00	66.00	*56.67*
CHARGES DETAILS														
Administration Charge per day for monthdays	R 91.6700	R 2,760.10	R 3,077.68	R 3,077.68	R 2,879.12	R 3,176.96	R 2,978.40	R 2,841.77	R 3,077.68	R 2,879.12	R 3,077.68	R 2,978.40	R 3,290.03	R 36,094.62
TX Network Capacity Charge /kVA	R 8.9200	R 82,543.33	R 89,200.00	R 89,200.00	R 89,200.00	R 89,200.00	R 89,200.00	R 89,200.00	R 89,200.00	R 89,200.00	R 89,200.00	R 89,200.00	R 89,200.00	R 1,063,743.33
Network Capacity Charge /kVA	R 17.6800	R 88,643.33	R 176,800.00	R 176,800.00	R 176,800.00	R 176,800.00	R 176,800.00	R 176,800.00	R 176,800.00	R 176,800.00	R 176,800.00	R 176,800.00	R 176,800.00	R 2,033,443.33
Network Demand Charge /kVA	R 33.5200	R 86,276.87	R 87,697.71	R 87,598.15	R 80,607.22	R 87,440.27	R 84,509.62	R 83,802.35	R 89,501.75	R 91,302.11	R 88,922.18	R 86,657.68	R 90,025.02	R 1,044,340.93
Ancillary Service Charge /kWh	R 0.0044	R 3,958.40	R 3,821.95	R 3,759.40	R 3,623.74	R 4,010.19	R 4,294.24	R 4,745.20	R 5,279.66	R 5,117.62	R 5,125.93	R 4,449.94	R 5,435.23	R 53,621.49
High Season Off Peak Energy Charge /kWh	R 0.5676	R 246,031.24	R 257,294.22	R 134,329.35	R -	R -	R -	R -	R -	R -	R -	R -	R 141,675.66	R 779,330.47
Low Season Off Peak Energy Charge /kWh	R 0.4914	R -	R -	R 80,278.54	R 197,166.39	R 210,844.02	R 227,269.55	R 309,600.18	R 267,023.81	R 281,417.90	R 316,395.75	R 239,722.12	R 201,172.04	R 2,330,890.30
High Season Peak Energy Charge / kWh	R 3.4504	R 396,065.07	R 415,635.18	R 228,005.86	R -	R -	R -	R -	R -	R -	R -	R -	R 262,270.79	R 1,301,976.90
Low Season Peak Energy Charge / kWh	R 1.1257	R -	R -	R 66,946.50	R 114,518.14	R 165,558.95	R 178,322.09	R 138,717.62	R 213,471.56	R 193,266.91	R 163,220.51	R 163,299.47	R 129,460.57	R 1,526,782.32
High Season Standard Energy Charge /kWh	R 1.0453	R 367,540.74	R 308,221.34	R 203,102.84	R -	R -	R -	R -	R -	R -	R -	R -	R 196,315.10	R 1,075,180.02
Low Season Standard Energy Charge /kWh	R 0.7747	R -	R -	R 104,217.29	R 248,379.30	R 259,730.95	R 275,064.16	R 251,924.21	R 361,702.19	R 324,385.10	R 291,383.57	R 293,184.66	R 218,559.50	R 2,628,530.93
Electrification and Rural Subsidy /kWh	R 0.0858	R 77,205.78	R 74,528.03	R 73,308.29	R 70,662.99	R 78,198.72	R 83,737.63	R 92,531.35	R 102,953.31	R 99,793.55	R 99,955.71	R 86,773.74	R 105,986.94	R 1,045,636.04
High Season Reactive energy Charge /kvarh	R 0.1549	R 21,644.98	R 24,081.37	R 9,359.83	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 55,086.19
Service Charge	R 206.0955	R 6,101.11	R 6,827.44	R 6,827.44	R 6,388.96	R 7,047.68	R 6,607.20	R 6,827.44	R 6,827.44	R 6,386.96	R 6,827.44	R 6,607.20	R 6,182.86	R 79,459.17
Total Charges		R 1,378,770.96	R 1,447,184.92	R 1,266,811.17	R 990,225.86	R 1,082,007.75	R 1,128,782.88	R 1,156,990.13	R 1,315,837.39	R 1,270,549.26	R 1,240,908.77	R 1,149,673.20	R 1,626,373.74	R 14,974,656.87
Consumption Charges		R 1,009,637.05	R 981,150.74	R 816,880.38	R 560,063.83	R 636,133.92	R 680,655.80	R 700,242.02	R 842,197.56	R 799,069.90	R 770,999.84	R 696,206.24	R 1,149,453.66	R 9,642,690.94
Ancillary Charges		R 369,133.91	R 466,034.18	R 449,930.79	R 430,162.04	R 445,873.83	R 448,127.07	R 456,748.11	R 473,639.82	R 471,479.36	R 469,908.94	R 453,466.96	R 476,920.08	R 5,331,965.93
Consumption Charges as % of Total Charges		73.23%	67.80%	64.48%	56.56%	58.79%	60.30%	60.52%	64.00%	62.89%	62.13%	60.56%	70.68%	63.50%
Ancillary Charges as % of Total Charges		26.77%	32.20%	35.52%	43.44%	41.21%	39.70%	39.48%	36.00%	37.11%	37.87%	39.44%	29.32%	36.50%

Intake Point		LOWER THUKELA SAPPI												
Premise ID		6274494579												
		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	
Month Days		31	31	30	31	30	31	31	28	31	30	31	30	
Notified Max Demand		10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	*10,000*
Utilized Capacity		10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	*10,000.00*
CONSUMPTION DETAILS														
HIGH SEASON ENERGY CONSUMPTION OFF PEAK kWH		522,162.42	465,453.96	299,256.00									616,445.34	1,903,317.72
LOW SEASON ENERGY CONSUMPTION OFF PEAK kWH				199,264.00	488,967.12	450,462.00	502,710.06	552,061.74	537,221.82	491,511.72	630,669.78	563,089.08		
HIGH SEASON ENERGY CONSUMPTION STD kWh		358,734.06	361,772.16	201,464.00									440,149.26	1,362,119.48
LOW SEASON ENERGY CONSUMPTION STD kWh				162,170.00	376,971.50	378,171.00	367,963.80	383,011.62	406,246.08	382,562.88	342,252.24	442,442.16		
HIGH SEASON ENERGY CONSUMPTION PEAK kWh		136,758.84	135,740.16	80,114.00									178,684.62	531,297.62
LOW SEASON ENERGY CONSUMPTION PEAK kWh				58,943.00	157,374.96	142,129.50	130,767.18	167,731.26	179,716.92	148,848.84	144,908.46	171,279.72		
ENERGY CONSUMPTION ALL kWh		1,017,655.32	962,966.28	1,001,211.00	1,023,313.58	970,762.50	1,001,441.04	1,102,804.62	1,123,184.82	1,022,923.44	1,117,830.48	1,176,810.96	1,235,279.22	12,756,183.26
DEMAND CONSUMPTION - OFF PEAK		2,583.99	2,599.73	2,555.58	2,362.44	2,476.10	2,378.76	2,453.28	2,341.44	2,462.64	2,456.64	2,523.72	2,498.76	29,693.08
DEMAND CONSUMPTION - STD		2,576.71	2,597.36	2,589.34	2,403.63	2,461.33	2,357.88	2,424.24	2,346.96	2,493.96	2,452.68	2,509.80	2,512.56	29,726.45
DEMAND CONSUMPTION - PEAK		2,566.80	2,580.64	2,559.58	2,426.36	2,459.75	2,376.12	2,416.68	2,329.80	2,469.39	2,411.28	2,499.48	2,483.04	29,578.92
DEMAND READING - KW/KVA		2,583.99	2,597.36	2,589.34	2,426.36	2,476.10	2,378.76	2,424.24	2,346.96	2,493.96	2,456.68	2,523.72	2,512.56	29,810.03
REACTIVE ENERGY - OFF PEAK		105,418.74	146,184.60	102,606.62	1,970.34	110,488.04	3,230.28	3,067.14	908.58	1,314.42	2,476.32	2,815.02	3,331.26	483,811.36
REACTIVE ENERGY - STD		60,747.00	116,857.74	70,941.78	4,567.36	92,555.94	2,891.76	1,743.66	908.16	1,481.52	1,711.14	2,627.10	2,102.10	359,135.26
REACTIVE ENERGY - PEAK		23,177.70	43,607.58	27,108.66	1,037.22	34,166.76	1,062.00	486.60	203.64	429.48	790.08	777.78	819.42	133,666.92
EXCESS REACTIVE ENERGY		25,882.30	26,207.51	27,133.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79,222.95
LOAD FACTOR		57.00	52.00	57.00	60.00	55.00	58.00	60.00	64.00	61.00	61.00	64.00	66.00	*59.58*
CHARGES DETAILS														
Administration Charge per day for monthdays	R 106.1300	R 3,067.50	R 3,290.03	R 3,290.03	R 3,183.90	R 3,290.03	R 3,183.90	R 3,290.03	R 3,290.03	R 2,971.64	R 3,290.03	R 3,183.90	R 3,290.03	R 38,621.05
TX Network Capacity Charge /kVA	R 9.5400	R 91,886.67	R 95,400.00	R 95,400.00	R 95,400.00	R 95,400.00	R 95,400.00	R 95,400.00	R 95,400.00	R 95,400.00	R 95,400.00	R 95,400.00	R 95,400.00	R 1,141,286.67
Network Capacity Charge /kVA	R 18.9000	R 182,085.67	R 189,000.00	R 189,000.00	R 189,000.00	R 189,000.00	R 189,000.00	R 189,000.00	R 189,000.00	R 189,000.00	R 189,000.00	R 189,000.00	R 189,000.00	R 2,261,085.67
Network Demand Charge /kVA	R 35.8300	R 88,950.95	R 93,063.41	R 92,776.05	R 86,936.48	R 88,189.81	R 85,230.97	R 86,860.52	R 84,091.58	R 89,358.59	R 87,879.52	R 90,424.89	R 90,025.02	R 1,063,787.79
Ancillary Service Charge /kWh	R 0.0047	R 4,610.76	R 4,525.94	R 4,705.69	R 4,809.58	R 4,562.59	R 4,706.77	R 5,183.18	R 5,278.97	R 4,807.74	R 5,253.80	R 5,531.01	R 5,805.81	R 59,781.84
High Season Off Peak Energy Charge /kWh	R 0.6068	R 304,999.31	R 282,437.49	R 181,588.54	R -	R -	R -	R -	R -	R -	R -	R -	R 141,675.66	R 910,701.00
Low Season Off Peak Energy Charge /kWh	R 0.5253	R -	R -	R 104,673.38	R 256,854.37	R 236,627.69	R 264,073.56	R 289,998.17	R 282,202.72	R 258,191.25	R 331,290.95	R 295,790.65	R 201,172.04	R 2,520,874.78
High Season Peak Energy Charge / kWh	R 3.6885	R 485,662.10	R 500,676.99	R 295,500.49	R -	R -	R -	R -	R -	R -	R -	R -	R 262,270.79	R 1,544,110.37
Low Season Peak Energy Charge / kWh	R 1.2034	R -	R -	R 70,932.01	R 189,385.03	R 171,038.64	R 157,365.22	R 201,847.80	R 216,271.34	R 179,124.69	R 174,382.84	R 206,118.02	R 129,460.57	R 1,695,926.16
High Season Standard Energy Charge /kWh	R 1.1174	R 386,937.82	R 404,244.03	R 225,115.87	R -	R -	R -	R -	R -	R -	R -	R -	R 196,315.10	R 1,212,612.83
Low Season Standard Energy Charge /kWh	R 0.8282	R -	R -	R 134,309.19	R 312,207.80	R 313,201.22	R 304,747.62	R 317,210.22	R 336,453.00	R 316,838.58	R 283,453.31	R 366,430.60	R 218,559.50	R 2,903,411.04
Electrification and Rural Subsidy /kWh	R 0.0917	R 89,932.04	R 88,303.98	R 91,811.05	R 93,837.89	R 89,018.97	R 91,832.14	R 101,127.22	R 102,996.06	R 93,802.04	R 102,505.01	R 107,913.57	R 113,275.08	R 1,166,355.06
High Season Reactive energy Charge /kvarh	R 0.1656	R 4,247.30	R 4,340.04	R 4,493.22	R -	R -	R -	R -	R -	R -	R -	R -	R -	R 13,080.57
Service Charge	R 264.2880	R 6,804.80	R 7,928.64	R 7,928.64	R 7,063.20	R 7,928.64	R 7,063.20	R 7,298.64	R 7,298.64	R 6,592.32	R 7,928.64	R 7,063.20	R 7,928.64	R 88,827.20
Total Charges		R 1,649,184.93	R 1,673,210.56	R 1,501,524.17	R 1,238,678.24	R 1,198,257.59	R 1,202,603.38	R 1,297,215.78	R 1,322,282.33	R 1,236,086.85	R 1,280,384.09	R 1,366,855.83	R 1,654,178.24	R 16,531,634.81
Consumption Charges		R 1,177,599.23	R 1,187,358.51	R 1,012,119.48	R 758,447.19	R 720,867.55	R 726,186.41	R 809,056.19	R 834,927.06	R 754,154.52	R 789,127.10	R 868,339.26	R 1,149,453.66	R 10,787,636.17
Ancillary Charges		R 471,585.70	R 485,852.05	R 489,404.69	R 480,231.05	R 477,390.04	R 476,416.97	R 488,159.59	R 487,355.27	R 481,932.32	R 491,256.99	R 498,516.57	R 504,724.58	R 5,743,998.64
Consumption Charges as % of Total Charges		71.40%	70.96%	67.41%	61.23%	60.16%	60.38%	62.37%	63.14%	61.01%	61.63%	63.53%	69.49%	64.39%
Ancillary Charges as % of Total Charges		28.60%	29.04%	32.59%	38.77%	39.84%	39.62%	37.63%	36.86%	38.99%	38.37%	36.47%	30.51%	35.61%

ANNEXURE 2

Electricity Tariff Book 2021/2022

The Executive committee of the Mandeni Municipality, acting under the authority of section 75 of the Municipal Systems Act (No. 32 of 2000) hereby published the subjoined tariffs of charges as made by the municipality of the said Municipality for 2021/22

Mr S G Khuzwayo
Municipal Manager

MANDENI
MUNICIPALITY

TARIFFS OF CHARGES

All tariffs shown hereunder are net, and any taxes, such as Value Added Tax will be added on.
Unless otherwise indicated, these tariffs shall apply to all areas in Mandeni

		2020/2021	2021/2022
1	**ADVERTISING**	**1.06**	**1.05**
	Licence fees for advertising signs		
(a)	Temporary signs General advertisement of events, meetings		
	(i) 0 - 20 or part thereof per poster ……..……R	**46.59**	**48.92**
	(ii) 30 - 50 or part thereof per poster……...……..R	**23.30**	**24.46**
	(iii) Banners (per banner)……..……...……..R	**355.10**	**372.86**
	(iv) Advertisement Trailer……..……...……..R	**355.10**	**372.86**
	Refundable deposit is 50% of the advertisement fee……..R		
(b)	Signs other than temporary signs:		
	(i) For each sign, or each block of signs Regulation18(6) for 12 months..R	**396.03**	**415.84**
	(ii) For each sign, or each block of signs Regulation 18(6) for 6 months….R	**230.63**	**242.16**
2	**BUILDING PLAN TARIFFS**		
2.1.	Every application for the approval of any building plan shall be accompanied by the following fees:		
	(a) New buildings - first 20 square meters of floor space……..…….R	**442.89**	**465.04**
	Every m^2 thereafter... ……..……..R	**8.19**	**8.60**
	(b) Industrial Buidlings - first 300 square meters of floor space…..…….R	**664.34**	**697.56**
	Every m^2 thereafter……...R	**8.19**	**8.60**
	(c) Minor works in terms of the National Building Regulations Or other work not listed ..…….....R	**221.45**	**232.52**
	(d) Alterations and additions, per square meter of additional Floor space…….…….. ……..…….R	**7.75**	**8.14**
	With a minimum fee where there is no increasing floor area…….R	**221.45**	**232.52**
	(e) Amended plans with no increase in floor area……..……...R	**221.45**	**232.52**
	(f) Plans which have lapsed and are resubmitted without alteration	**25% of original fees**	**25% of original fees**
	(g) Swimming pools, (additional to other building fees)……..R	**221.45**	**232.52**
	(h) Boundary walls or retaining walls over one meter high (additional to other building plan fees)……R	**221.45**	**232.52**
	(i) Pre-scrutiny of plans for comment……..R		
	(j) Sidewalk deposit (Verge fees)……..R	**664.34**	**697.56**
2.2.	**TOWNSHIP LAYOUT PLANS**		
2.2.1	**A4**		
	Media - Full Colour		
	Paper	**27.90**	**29.30**
	Film	**34.99**	**36.74**
	Media - Line Map		
	Paper	**11.74**	**12.32**
	Film	**16.39**	**17.21**
2.2.2	**A3**		
	Media - Full Colour		
	Paper	**46.50**	**48.83**
	Film	**58.24**	**61.15**
	Media - Line Map		
	Paper	**23.25**	**24.41**
	Film	**30.34**	**31.86**

2.2.3	**A2**			
	Media - Full Colour			
	Paper		**93.01**	**97.66**
	Film		**104.74**	**109.98**
	Media - Line Map			
	Paper		**58.24**	**61.15**
	Film		**69.76**	**73.24**
2.2.4	**A1**			
	Media - Full Colour			
	Paper		**104.74**	**109.98**
	Film		**139.51**	**146.49**
	Media - Line Map			
	Paper		**93.01**	**97.66**
	Film		**104.74**	**109.98**
2.2.5	**A0**			
	Media - Full Colour			
	Paper		**209.27**	**219.73**
	Film		**232.52**	**244.14**
	Media - Line Map			
	Paper		**116.26**	**122.07**
	Film		**128.00**	**134.40**
3	**ELECTRICITY SUPPLY TARIFFS**		**1.06**	**1.15**
3.1	**Domestic Consumers ,churches and old age homes**		**1.7267**	**1.9786**
			1.7429	**1.9972**
			1.7588	**2.0154**
3.1.1	Consumption charge	**c/Kwh**	**c/Kwh**	
	Inclining Block Tariff in c/kWh			
	0 - 50		**0.9960**	**1.1413**
	51 - 350		**1.3593**	**1.5576**
	351 - 600		**1.4908**	**1.7083**
	> 600		**2.0249**	**2.3203**
3.1.2	Domestic high			
	Monthly service charge(which excludes any kilowatt hour of electricity consumed			
	For a single-phase connection per month		**250.97**	**287.59**
	For a three-phase connection per month		**387.94**	**444.54**
	Indigent user		Nil	**Nil**
3.2.	**Businesses, clubs, boarding houses, hotels, schools and hostels, Government/Provincial**			
3.2.1.	Monthly service charge(which charge excludes any kilowatt hour of electricity consumed			
	For a single-phase connection per month		**387.94**	**444.54**
	For a three-phase connection per month		**1,070.92**	**1,227.16**
3.2.2.	Consumption Charge	**/Kwh**	**/Kwh**	
	Irrespective of kwh used		**1.82**	**2.08**
3.2.3	Commercial Prepaid			
	For single -phase connection per month		**2.32**	**2.66**
3.3.	**Large Consumers**			
3.3.1.	Monthly service charge (which charge excluded any kilowatt hour of electricity consumed)		**1,279.98**	**1,466.73**
3.3.2.	Consumption charge for KVA		**286.19**	**327.95**
3.3.3.	Consumption charges	**/Kwh**	**/Kwh**	
	Irrespective of kwh used		**0.44**	**0.51**
3.4.	**Bulk supply at 11 000 V**			
3.4.1.	Monthly supply at 11 000 V			
	Monthly service charge (which charge excludes any kilowatt)		**1,355.57**	**1,553.35**
	Where 50 KVA or more is installed		**286.02**	**327.76**
3.4.2.	Consumption charge	**/Kwh**	**/Kwh**	
	Irrespective of kwh used		**0.88**	**1.00**
3.5.	**Testing Fee**			
3.5.1	Special fee for testing installation at consumers request, including Compliance tests		**1,575.23**	**1,805.05**
3.5.2	Meter test			
	Single phase conventional meter		**827.00**	**947.66**
	400V Three phase conventional meter		**1,791.83**	**2,053.25**
	11 kv meter		Cost + 10%	Cost + 10%
	Special Provision for Electricity		Cost + 10%	Cost + 10%
3.5.3	Inspection fee: after failure upon first test		**393.80**	**451.25**
3.5.4	Fee for checking meter reading			
	(which fee will be refunded should the reading be found to be incorrect)		**196.89**	**225.62**
3.6	**Disconnection Charge**			
	Final notice of demand			
3.6.1	Properties within the municipal boundaries		**393.80**	**451.25**
3.6.2	Properties outside the municipal boundaries(plus R2.00/km)		**393.80**	**451.25**
3.7	**Reconnection Charge (penalties for services that may be disconnected if not paid on due date)**			
	Properties within municipality			
3.7.1	For non-payment of account		**467.64**	**535.87**
3.7.2	For other reasons, per each occasion		**467.64**	**535.87**
	Properties outside municipal boundary		**0.00**	**0.00**
3.7.3	For non-payment of account		**467.64**	**535.87**
3.7.4	For other reasons, per each occasion (plus R2.00/km)		**467.64**	**535.87**
3.7.5	Connection charge – after office hours		**935.29**	**1,071.75**

3.8 Disconnection		
Where disconnection is performed by a private contractor at the request of the Chief Financial Officer	**728.84**	**835.17**

3.9	**Connection Charge**		
3.9.1	**60 A single-phase**		
	From the nearest point of supply not exceeding 40 m to the boundary of the property requiring connection	**4,494.49**	**5,150.24**
3.9.2	**60 A Three-phase**		
	From the nearest point of supply not exceeding 40 m to the boundary of the property requiring connection	**16,277.35**	**18,652.22**
3.9.3	In addition to the charges prescribed in sub-paragraphs 1 and 2 hereof, there shall be paid a charge representing the cost of material and labour plus 10% of such cost in respect of the connection from the boundary of the property requiring connection to the meter on the said property and in the event of the distance from the nearest point of supply to such boundary exceeding 40m in respect of such additional distance		
3.9.4	In the above, costs include the cost of the meter equipment and cables and service apparatus, all of which shall remain the property of the Council		
3.9.5	When overhead service connection to any property has to be reconstructed as to comply with the Machinery Occupational Safety Act a fee shall be paid in advance	**364.42**	**417.59**
3.10.	**Connection fees for the supply of Electricity to Building Contractors**		
3.10. 1	**Connections other than 3 phase**		
	Connection fees (including disconnection)	**4,240.09**	**4,858.72**
	Minimum monthly charge	**345.40**	**395.79**
	Plus all kilowatt hours consumed at Maximum period of supply 6 months	**R0.75/ kwh**	**R0.75/ kwh**
3.10. 2	**3 phase connections**		
	Connection fees (including disconnection)	**15,355.99**	**17,596.43**
	Minimum monthly charge	**953.45**	**1,092.55**
	Plus all kilowatt hours consumed at Maximum period of supply 6 months	**R0.75/ kwh**	**R0.75/ kwh**
3.11	**Supply of electricity to Signboards**		
	Irrespective of kwh used per month	**534.48**	**612.46**
3.12	**Availability charge**		
	An availability charge is payable in respect of all properties, which can be yet or not served by the electricity reticulation network	**Nil**	**Nil**
3.13	**Tampering fee**	**4,227.25**	**4,844.01**
3.14	**Special Meter reading (on request)**	**777.43**	**890.85**
3.15	**Certificate of Compliance – revisit fee**	**874.60**	**1,002.21**
3.16	**Inspection of Installation (on request)**	**1,700.62**	**1,948.74**
3.17	**DEPOSITS**		
	Deposits referred to in bylaw 7(1) of the bylaws, are calculated at three times the estimated monthly consumption of electricity, or at the Municipality's discretion, but shall be at least the following:		
	Domestic consumer……R	**5,867.14**	**6,723.15**
	Small Scale consumer ……R	**5,867.14**	**6,723.15**
	Bulk consumer……R	**13,494.66**	**15,463.54**
4	**HIRE OF PLANT AND EQUIPMENT**		
	Digger / loader per hour……R	**505.47**	**530.75**
	Subject to the conditions as laid down by the Council from time to time.		
	All charges are for the period stated or part thereof.		
5	**HIRE OF PUBLIC HALLS**		
	TUGELA,MANQAKAZI,ISITHEBE,MACAMBINI,HLOMENDLINI		
A.	For meetings and other functions where promotion of culture is involved, or other functions approved by the Council:	**1,447.75**	**1,520.13**
	(i) TUGELA,MANQAKAZI,ISITHEBE,MACAMBINI HALL MEETING ROOMS		
	(a) Conducted for personal gain (per session)……..R	**107.16**	**112.52**
	(b) Not conducted for personal gain (per session)……..R	**43.56**	**45.74**
	A session will be: Morning 09h00 - 13h30; Afternoon 14h30 - 18h30; Evening 19h30 - 24h00		
B.	**(i) HIRE OF SUNDUMBILI HALL (INCLUDING KITCHEN)**		
	The hours of use for the above will be 07h00-24h00 (or part thereof) and a session will be three hours or part thereof.		
	Per function:		
		Per Hour	**Per Hour**
	For personal gain.....R	**753.20**	**790.86**
	Wedding Events ……R	**451.92**	**474.51**
	Cultural, Contest, Religious.....R	**301.28**	**316.34**
	Political and public meetings ……R	**301.28**	**316.34**

ANNEXURE 3

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	**Type here**
Licence number	**Type here**
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**	**S G**	**KHUZWAYO**	**032456**	**0324562504**	sizwe.khuzwayo@mandeni.gov.za
Chief Financial Officer:	**ms**	**N**	**Mngomezulu**	**0324568224**	**0324562504**	nozipho.mngomezulu@mandeni.gov.za
Contact Person:	**Mr**	**S H**	**MAKHOBA**	**0324568205**	**0324562504**	senzo.makhoba@mandeni.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:	28,344,584	28,290,355	23,139,190	20,441,858	20,441,858 kWh	18,845,699 kWh	1,028	**Sign here and include the date:**
Chief Financial Officer:	28,344,584	28,290,355	23,139,190	20,441,858	20,441,858 kWh	18,845,699 kWh	1,028	**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 %
100%	88%	7.81%	10%

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	**Type here**
Licence number	**Type here**
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**	**S H**	**MAKHOBA**	**0324568205**	**0324562504**	senzo.makhoba@mandeni.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 note: Balance sheet does not balance

Please Complete the following:

Capital Employed		**Actual 2018/19**
Funds & reserves		**0**
Statutory funds	**Type here**	
Reserves	**Type here**	
(Accumulated deficit) Retained surplus		**Type here**
Trust funds		**Type here**
Long-term liabilities		**Type here**
Consumer deposits		**442,043**
Total		**442,043**

442,043

Employment of Capital - Electricity Distribution Account			**Actual 2018/19**
Fixed assets			**0**
Buildings & other fixed assets		**Type here**	
Electricity distribution network and equipment		**Type here**	
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			**0**

NET CURRENT ASSETS / LIABILITIES	**0**

Current Assets		**Actual 2018/19**
Inventory		**Type here**
Debtors (a) + (b)		**0**
Less than 90 days (a)	**Type here**	
90 days or more (b)	**Type here**	
Cash		**Type here**
Short-term investments		**Type here**
Short-term portion of long-term debtors		**Type here**
Total		**0**

Current Liabilities	**Actual 2018/19**
Provisions	**Type here**
Creditors: Eskom	**Type here**
Creditors: Other	**Type here**
Short-term portion of long-term liabilities	**Type here**
Bank overdraft	**Type here**
Total	**0**

0

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	Type here
Licence number	Type here
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
Contact Person:	mr	S H	MAKHOBA	0324568205	0324562504	senzo.makhoba@mandeni.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	Not completed
Expenditure section	Completed	Not completed

REVENUE:

Revenue from sale of electricity to the following consumers:	Actual 2018/19	Budget 2019/20
Domestic (pre-paid)	5,192,638	Type here
Domestic (conventional)	7,564,980	Type here
Agriculture	Type here	Type here
Mining & quarrying	Type here	Type here
Manufacturing / Industrial	Type here	Type here
Commercial (pre-paid)	Type here	Type here
Commercial (conventional)	Type here	Type here
Transport	Type here	Type here
Redistributors/Resellers	Type here	Type here
Other consumers (please specify below)	15,401,696	0
1. UMGENI WATER	15,401,696	Type here
2.	Type here	Type here
3.	Type here	Type here
4.	Type here	Type here
Total	28,159,315	0

Revenue from street lighting & sold to other municipal departments	Actual 2018/19	Budget 2019/20
Street lighting	131,040	Type here
Sold to other municipal departments	Type here	Type here
Total	131,040	0

Other Income	Actual 2018/19	Budget 2019/20
Reconnection fees	Type here	Type here
New connections	54,229	Type here
Free Basic Electricity(Equitable share)	Type here	Type here
Other revenue (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
5.	Type here	Type here
6	Type here	Type here
Other Income	54,229	0

Summary Stats (for office use)	Actual 2018/19	Budget 2019/20
Total Income	28,344,584	-
Surplus	5,205,394	-

EXPENSES:

Electricity Purchases from:	Actual 2018/19	Budget 2019/20
Eskom	20,441,858.22	Type here
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	20,441,858.22	0

Repairs, Maintenance and Salaries	Actual 2018/19	Budget 2019/20
Repairs and Maintenance:	2,688,452	0
1. Salaries and allowances	2,606,052	Type here
2. Materials and supplies	82,400	Type here
3. Contracted Services		Type here
Salaries, wages and allowances including payments to consultants		
1. Salaries, wages and allowances (Excl. Repairs and Maintenance)	Type here	Type here
2. Payments to consultants (operational work)	Type here	Type here
Total	2,688,452	0

Financial Costs	Actual 2018/19	Budget 2019/20
Interest	8,879.89	Type here
Total	8,879.89	0

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

Other Expenses	Actual 2018/19	Budget 2019/20
Bad debts	Type here	Type here
FBE paid to Eskom	Type here	Type here
Charges from other Municipal Departments	Type here	Type here
General Expenses (please specify below) (Group into 6-main categories)	0	0
1.	Type here	Type here
2.	Type here	Type here
3.	Type here	Type here
4.	Type here	Type here
5.	Type here	Type here
6.	Type here	Type here
Total	0	0

	Actual 2018/19	Budget 2019/20
Total Expenditure	23,139,190	-

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	**Type here**
Licence number	**Type here**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatc 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**	**S H**	**MAKHOBA**	**0324568205**	**0324562504**	**senzo.makhoba@mandeni.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	Type here	Type here	20,441,858.22 -	Type here	Type here R/kVA/month	Type here R/kVA/month	100.00 c/kW	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/kW	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/kW	c/kWh
Self Generation	Type here	Type here	Type here	Type here	Type here R/kVA/month	Type here R/kVA/month	c/kW	c/kWh
Other	Type here	Type here	Type here	Type here	Type here R/kVA/month	Type here R/kVA/month	c/kW	c/kWh
Total	-	-	20,441,858 kWh	- kWh	- R/kVA/month	- R/kVA/month	100 c/kW	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	Type here	Type here	Type here	Type here	Type here	Type here kWh				
Domestic (pre-paid)	662	Type here	Type here	3,637,913.00	Type here	Type here kWh	142.74			
Domestic (conventional)	315	Type here	Type here	4,123,980.00	Type here	Type here kWh	183.44			
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)	Type here	Type here	Type here	Type here	Type here	Type here kWh			Complete Actual Sales kWh	
Commercial (conventional)	50	Type here	Type here	Type here	Type here	Type here kWh			Complete Actual Sales kWh	
Transport	Type here	Type here	Type here	Type here	Type here	Type here kWh				
Other consumers	1	Type here	Type here	10,952,766	Type here	Type here kWh	140.62			
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				131,040	Type here	Type here kWh	100.00			
Sold to other municipal departments	Type here	Type here	Type here	Type here	Type here	Type here kWh				
Total	1,028	-	-	18,845,699 kWh	- kWh	- kWh	150.12			

System factors	**Actual 2018/19**	**Budget 2019/20**
Average system load factor	61	Type here
Average system power factor	Type here	Type here
Energy losses kWh	7.81%	

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	**Type here**
Licence number	**Type here**
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
Contact Person:	**MR**	**S H**	**MAKHOBA**	**0324568205**	**0324562504**	**senzo.makhoba@mandeni.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	**1**	**Type here**
Skilled Labour	**2**	**Type here**
Unskilled Labour	**2**	**Type here**
Trainees	**1**	**Type here**
Total staff	6	-
Vacancies	**Type here**	**Type here**

Grand total	**6**

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	**Type here**
Licence number	**Type here**
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**	**S**	**MAKHOBA**	**0324568205**	**0324562504**	**senzo.makhoba@mandeni.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									
residential	771	0	1	5.1	315	4,123,980 kWh	7,564,980	Type here	Type here	7,564,980	Type here %
business	business	6	5	5.1	35	Type here kWh	Type here	Type here	Type here	0	Type here %
business	kva	6	5	5.1	5	Type here kWh	Type here	Type here	Type here	0	Type here %
business	733	6	5	5.1	1	Type here kWh	Type here	Type here	Type here	0	Type here %
business	799	6	5	5.1	1	Type here kWh	Type here	Type here	Type here	0	Type here %
business	778	6	5	5.1	5	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 %
Umgeni	Industrial	10	6	5.1	1	10,952,766 kWh	15,401,696	Type here	Type here	15,401,696	Type here %
Prepaid	771	Type here	Type here	Type here	662	3,637,913 kWh	5,192,638	Type here	Type here	5,192,638	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 %
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 kWh	Type here	Type here	Type here	0	Type here %
Total					**1,025**	**18,714,659** kWh	**28,159,315**	**0**	**0**	**28,159,315**	

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	**Type here**
Licence number	**Type here**
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
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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
Municipal Manager:	**MR**	**S H**	**MAKHOBA**	**0324568205**	**0324562504**	senzo.makhoba@mandeni.gov.za
Chief Financial Officer:	**ms**	**N N**	**MNGOMEZULU**	**0324568204**	**0324562504**	nozipho.mngomezulu@mandeni.gov.za
Contact Person:	**Mr**	**S G**	**Khuzwayo**	**0324568200**	**0324562504**	sizwe.khuzwayo@mandeni.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:	39,388,057	37,815,168	37,577,260	26,354,808	21,548,189 kWh	20,899,622 kWh	1,031	**Sign here and include the date:**
Chief Financial Officer:	39,388,057	37,815,168	37,577,260	26,354,808	21,548,189 kWh	20,899,622 kWh	1,031	**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 %
96%	70%	3.01%	6%

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	**Type here**
Licence number	**Type here**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatory Reporting Specialist) dforms@nersa.org.za (012) 401-4600
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	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**	**S H**	**Makhoba**	**0324568205**	**0324562504**	senzo.makhoba@mandeni.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 note: Balance sheet does not balance

Please Complete the following:

Capital Employed		Actual 2019/20
Funds & reserves		**0**
Statutory funds	**Type here**	
Reserves	**Type here**	
(Accumulated deficit) Retained surplus		**Type here**
Trust funds		**Type here**
Long-term liabilities		**Type here**
Consumer deposits		**386,100**
Total		**386,100**

Employment of Capital - Electricity Distribution Account			Actual 2019/20
Fixed assets			**88,741,182**
Buildings & other fixed assets		**88,741,182**	
Electricity distribution network and equipment		**Type here**	
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			**88,741,182**

NET CURRENT ASSETS / LIABILITIES			213,806,223

Current Assets		Actual 2019/20
Inventory		**979,669**
Debtors (a) + (b)		**233,137,161**
Less than 90 days (a)	**14,706,645**	
90 days or more (b)	**218,430,516**	
Cash		**Type here**
Short-term investments		**Type here**
Short-term portion of long-term debtors		**Type here**
Total		**233,137,161**

Current Liabilities	Actual 2019/20
Provisions	**Type here**
Creditors: Eskom	**Type here**
Creditors: Other	**19,330,938**
Short-term portion of long-term liabilities	**Type here**
Bank overdraft	**Type here**
Total	**19,330,938**

386,100

302,547,404

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	Type here
Licence number	Type here
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:	Type here	Type here	Type here	Type here	Type here	Type here

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 2019/20	Budget 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)	6,535,899	Type here
Domestic (conventional)	3,138,153	Type here
Agriculture	Type here	Type here
Mining & quarrying	Type here	Type here
Manufacturing / Industrial	Type here	Type here
Commercial (pre-paid)	Type here	Type here
Commercial (conventional)	9,323,702	Type here
Transport	Type here	Type here
Redistributors/Resellers	Type here	Type here
Other consumers (please specify below)	18,817,413	0
1.	18,817,413	Type here
2.	Type here	Type here
3.	Type here	Type here
4.	Type here	Type here
Total	37,815,168	0

Revenue from street lighting & sold to other municipal departments	Actual 2019/20	Budget 2020/21
Street lighting	Type here	Type here
Sold to other municipal departments	Type here	Type here
Total	0	0

Other Income	Actual 2019/20	Budget 2020/21
Reconnection fees	33,925	Type here
New connections	40,091	Type here
Free Basic Electricity(Equitable share)	1,498,873	1,340,017
Other revenue (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
5.	Type here	Type here
6.	Type here	Type here
Other Income	1,572,890	1,340,017

Summary Stats (for office use)	Actual 2019/20	Budget 2020/21
Total Income	39,388,057	1,340,017
Surplus	1,810,797	- 2,576,003

EXPENSES:

Electricity Purchases from:	Actual 2019/20	Budget 2020/21
Eskom	26,354,808	Type here
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	26,354,808	0

Repairs, Maintenance and Salaries	Actual 2019/20	Budget 2020/21
Repairs and Maintenance:	2,362,818	520,081
1. Salaries and allowances	1,612,640	Type here
2. Materials and supplies	Type here	Type here
3. Contracted Services	750,178	520,081
Salaries, wages and allowances including payments to consultants		
1. Salaries, wages and allowances (Excl. Repairs and Maintenance)	Type here	Type here
2. Payments to consultants (operational work)	Type here	Type here
Total	2,362,818	520,081

Financial Costs	Actual 2019/20	Budget 2020/21
Interest	441	Type here
Total	441	0

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	716,891	1,209,631
FBE paid to Eskom	1,374,243	Type here
Charges from other Municipal Departments	Type here	Type here
General Expenses (please specify below) (Group into 6-main categories)	6,768,058	2,186,308
1.		
2. printing and stationery	1,246,818	1,146,793
3.subsistence and travelling	1,059,197	Type here
4.telephone and fax	3,288,493	Type here
5.Others	1,173,550	1,039,515
6.	Type here	Type here
Total	8,859,192	3,395,939

	Actual 2019/20	Budget 2020/21
Total Expenditure	37,577,260	3,916,020

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	**Type here**
Licence number	**Type here**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulat 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**
Contact Person:	**Type here**	**Type here**	**Type here**	**Type here**	**Type here**	**Type here**

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	Type here	Type here	21,548,189	Type here	Type here	R/kVA/month	Type here	R/kVA/month	122.31 c/kWh	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	-	-	21,548,189 kWh	- kWh	-	R/kVA/month	-	R/kVA/month	122.306369 c/kWh	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	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Domestic (pre-paid)	681	Type here	Type here	4,053,916	Type here	Type here	kWh	161.22			
Domestic (conventional)	299	Type here	Type here	4,563,258	Type here	Type here	kWh	68.77			
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)	Type here	Type here	Type here	Type here	Type here	Type here	kWh			Complete Actual Sales kWh	
Commercial (conventional)	50	Type here	Type here	Type here	Type here	Type here	kWh			Complete Actual Sales kWh	
Transport	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Other consumers	1	Type here	Type here	12,088,896	Type here	Type here	kWh	155.66			
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				193,551	Type here	Type here	kWh	#VALUE!			
Sold to other municipal departments	Type here	Type here	Type here	Type here	Type here	Type here	kWh				
Total	1,031	-	-	20,899,622 kWh	- kWh	-	kWh	180.94			

System factors	Actual 2019/20	Budget 2020/21
Average system load factor	56	Type here
Average system power factor	Type here	Type here
Energy losses kWh	3.01%	

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	**Type here**
Licence number	**Type here**
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
Contact Person:	**Mr**	**S H**	**MAKHOBA**	**0324568205**	**0324562504**	**senzo.makhoba@mandeni.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	**1**	**Type here**
Skilled Labour	**2**	**Type here**
Unskilled Labour	**2**	**Type here**
Trainees	**2**	**Type here**
Total staff	7	-
Vacancies	**Type here**	**Type here**

Grand total	**7**

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	**Type here**
Licence number	**Type here**
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	S H	MAKHOBA	0324568205	0324562504	senzo.makhoba@mandeni.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											
HOUSEHOLD	771	0	1	5.1	299	4,563,258	kWh	9,947,120	Type here	Type here	9,947,120	Type here	%
BUSINESS	BUSINESS	6	5	5.1	36	857,106	kWh	9,947,120	Type here	Type here	9,947,120	Type here	%
BUSINESS	778	6	5	5.1	7	Type here	kWh	Type here	Type here	Type here	0	Type here	%
BUSINESS	773	6	5	5.1	1	Type here	kWh	Type here	Type here	Type here	0	Type here	%
BUSINESS	KVA	6	5	5.1	5	Type here	kWh	Type here	Type here	Type here	0	Type here	%
BUSINESS	779	6	5	5.1	1	Type here	kWh	Type here	Type here	Type here	0	Type here	%
prepaid	771	0	1	5.1	681	6,053,916	kWh	6,535,899	Type here	Type here	6,535,899	Type here	%
umgeni water	industrial	5	6	5.1	1	9,425,341	kWh	11,385,029	Type here	Type here	11,385,029	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	%
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					**1,031**	**20,899,622**	kWh	**37,815,168**	**0**	**0**	**37,815,168**		

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	**Mandeni**
Licence number	**Type here**
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
Municipal Manager:	**Mr**	**S G**	**KHUZWAYO**	**0324568255**	**0324562504**	Sizwe.Khuzwayo@mandeni.gov.za
Chief Financial Officer:	**Ms**	**N N**	**MNGOMEZULU**	**0324568204**	**0324562504**	cfo@mandeni.gov.za
Contact Person:	**Mr**	**S H**	**MAKHOBA**	**0324568205**	**0324562504**	senzo.makhoba@mandeni.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:	48,621,685	46,903,890	47,075,021	28,817,906	22,211,843 kWh	21,417,624 kWh	952	**Sign here and include the date:**
Chief Financial Officer:	48,621,685	46,903,890	47,075,021	28,817,906	22,211,843 kWh	21,417,624 kWh	952	**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 %
96%	61%	3.58%	6%

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	**Mandeni**
Licence number	**Type here**
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:	Mr	S H	Makhoba	0324568205	0324562504	senzo.makhoba@mandeni.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 note: Balance sheet does not balance

Please Complete the following:

Capital Employed		Actual 2020/21
Funds & reserves		**0**
Statutory funds	**Type here**	
Reserves	**Type here**	
(Accumulated deficit) Retained surplus		**Type here**
Trust funds		**Type here**
Long-term liabilities		**Type here**
Consumer deposits		**290,048**
Total		**290,048**

290,048

Employment of Capital - Electricity Distribution Account		Actual 2020/21
Fixed assets		**16,356,876**
Buildings & other fixed assets	**Type here**	
Electricity distribution network and equipment	**16,356,876**	
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		**16,356,876**

NET CURRENT ASSETS / LIABILITIES		
		164,430,602

Current Assets		Actual 2020/21
Inventory		**Type here**
Debtors (a) + (b)		**164,430,602**
Less than 90 days (a)	**10,057,272**	
90 days or more (b)	**154,373,329**	
Cash		**Type here**
Short-term investments		**Type here**
Short-term portion of long-term debtors		**Type here**
Total		**164,430,602**

Current Liabilities	Actual 2020/21
Provisions	**Type here**
Creditors: Eskom	**Type here**
Creditors: Other	**Type here**
Short-term portion of long-term liabilities	**Type here**
Bank overdraft	**Type here**
Total	**0**

180,787,477

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	**Mandeni**
Licence number	**Type here**
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**
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1. On the NERSA website:	www.nersa.org.za
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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**	**S H**	**Makhoba**	**0324568205**	**0324562504**	**senzo.makhoba@mandeni.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 2020/21**	**Budget 2021/22**
Revenue section	**Completed**	**Not completed**
Expenditure section	**Completed**	**Completed**

REVENUE:

Revenue from sale of electricity to the following consumers:	**Actual 2020/21**	**Budget 2021/22**
Domestic (pre-paid)	**10,912,002**	**Type here**
Domestic (conventional)	**5,284,898**	**Type here**
Agriculture	**Type here**	**Type here**
Mining & quarrying	**Type here**	**Type here**
Manufacturing / Industrial	**Type here**	**Type here**
Commercial (pre-paid)	**Type here**	**Type here**
Commercial (conventional)	**9,685,950**	**Type here**
Transport	**Type here**	**Type here**
Redistributors/Resellers	**Type here**	**Type here**
Other consumers (please specify below)	**21,021,040**	**0**
1.Umngeni water	**21,021,040**	**Type here**
2.	**Type here**	**Type here**
3.	**Type here**	**Type here**
4.	**Type here**	**Type here**
Total	**46,903,890**	**0**

Revenue from street lighting & sold to other municipal departments	**Actual 2020/21**	**Budget 2021/22**
Street lighting	**Type here**	**Type here**
Sold to other municipal departments	**Type here**	**Type here**
Total	**0**	**0**

Other Income	**Actual 2020/21**	**Budget 2021/22**
Reconnection fees	**Type here**	**Type here**
New connections	**95,126**	**Type here**
Free Basic Electricity(Equitable share)	**1,622,669**	**Type here**
Other revenue (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**
5.	**Type here**	**Type here**
6	**Type here**	**Type here**
Other Income	**1,717,795**	**0**

EXPENSES:

Electricity Purchases from:	**Actual 2020/21**	**Budget 2021/22**
Eskom	**28,817,906**	**Type here**
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	**28,817,906**	**0**

Repairs, Maintenance and Salaries	**Actual 2020/21**	**Budget 2021/22**
Repairs and Maintenance:	**2,774,546**	**0**
1. Salaries and allowances	**2,025,298**	**Type here**
2. Materials and supplies	**Type here**	**Type here**
3. Contracted Services	**749,248**	**Type here**
Salaries, wages and allowances including payments to consultants		
1. Salaries, wages and allowances (Excl. Repairs and Maintenance)	**Type here**	**Type here**
2. Payments to consultants (operational work)	**Type here**	**Type here**
Total	**2,774,546**	**0**

Financial Costs	**Actual 2020/21**	**Budget 2021/22**
Interest	**243**	**Type here**
Total	**243**	**0**

Notified Maximum Demand Costs	**Actual 2020/21**	**Budget 2021/22**
NMD Costs	**Type here**	**Type here**
Total	**0**	**0**

Other Expenses	**Actual 2020/21**	**Budget 2021/22**
Bad debts	**3,366,199**	**Type here**
FBE paid to Eskom	**1,580,676**	**Type here**
Charges from other Municipal Departments	**Type here**	**Type here**
General Expenses (please specify below) (Group into 6-main categories)	**10,535,451**	**750,178**
1.Prepaid Electricity vendors	**4,757,772**	**750,178**
2. Fuel and oil	**3,299,813**	**Type here**
3.Printing and stationery	**896,292**	**Type here**
4.Substances and travelling	**633,909**	**Type here**
5.Uniforms	**947,665**	**Type here**
6.	**Type here**	**Type here**
Total	**15,482,326**	**750,178**

Summary Stats (for office use)		
Total Income	**Actual 2020/21**	**Budget 2021/22**
	48,621,685	-
Surplus	**1,546,664**	**- 750,178**

	Actual 2020/21	**Budget 2021/22**
Total Expenditure	47,075,021	750,178

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	**Mandeni**
Licence number	**Type here**
Enquiries:	Veli Mahlangu (Senior Statistician) Thilivhali Nthakheni (Financial Regulatc 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**	**012014710**	**012014700**	dforms@nersa.org.za
Contact Person:	**MR**	**S H**	**MAKHOBA**	**0324568205**	**0324562504**	**senzo.makhoba@mandeni.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	**Type here**	**Type here**	**22,211,843**	**Type here**	**Type here** R/kVA/month	**Type here** R/kVA/month	129.74 **c/kW**	**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/kW**	**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/kW**	**c/kWh**
Self Generation	**Type here**	**Type here**	**Type here**	**Type here**	**Type here** R/kVA/month	**Type here** R/kVA/month	**c/kW**	**c/kWh**
Other	**Type here**	**Type here**	**Type here**	**Type here**	**Type here** R/kVA/month	**Type here** R/kVA/month	**c/kW**	**c/kWh**
Total	-	-	22,211,843 **kWh**	- **kWh**	- R/kVA/month	- R/kVA/month	129.7411778 **c/kW**	**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 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	**Type here**	**Type here**	**Type here**	**Type here**	**Type here**	**Type here** **kWh**				
Domestic (pre-paid)	**739**	**Type here**	**Type here**	**4,609,747**	**Type here**	**Type here** **kWh**	236.72			
Domestic (conventional)	**163**	**Type here**	**Type here**	**1,466,398**	**Type here**	**Type here** **kWh**	360.40			
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)	**Type here**	**Type here**	**Type here**	**Type here**	**Type here**	**Type here** **kWh**				
Commercial (conventional)	**49**	**Type here**	**Type here**	**2,354,670**	**Type here**	**Type here** **kWh**	411.35			
Transport	**Type here**	**Type here**	**Type here**	**Type here**	**Type here**	**Type here** **kWh**				
Other consumers	**1**	**Type here**	**Type here**	**12,836,809**	**Type here**	**Type here** **kWh**	163.76			
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				**150,000**	**Type here**	**Type here** **kWh**	#VALUE!			
Sold to other municipal departments	**Type here**	**Type here**	**Type here**	**Type here**	**Type here**	**Type here** **kWh**				
Total	**952**	-	-	**21,417,624 kWh**	**- kWh**	**- kWh**	**219.00**			

System factors	**Actual 2020/21**	**Budget 2021/22**
Average system load factor	**Type here**	**Type here**
Average system power factor	**Type here**	**Type here**
Energy losses kWh	3.58%	

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	**Mandeni**
Licence number	**Type here**
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**	**S H**	**MAKHOBA**	**0324568205**	**0324562504**	**senzo.makhoba@mandeni.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	**1**	**Type here**
Skilled Labour	**3**	**Type here**
Unskilled Labour	**2**	**Type here**
Trainees	**3**	**Type here**
Total staff	9	-
Vacancies	**Type here**	**Type here**

Grand total	**9**

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	**Mandeni**
Licence number	**Type here**
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:	**MR**	**S H**	**Makhoba**	**0324568205**	**0324562504**	**senzo.makhoba@mandeni.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									
Electricity KVA	778	6	6	5.1	7	Type here kWh	8,982,509	Type here	Type here	8,982,509	Type here %
EL IND>11000V	773	6	6	5.1	1	Type here kWh	Type here	Type here	Type here	0	Type here %
EL DOM H CONV	771	0	1	5.1	163	3,971,068 kWh	2,290,728	Type here	Type here	2,290,728	Type here %
EL COM 3PHASE	Business	6	6	5.1	35	Type here kWh	6,691,780	Type here	Type here	6,691,780	Type here %
EL IND>11000V	779	6	6	5.1	1	Type here kWh	Type here	Type here	Type here	0	Type here %
EL IND>11000V	50kva	6	6	5.1	5	Type here kWh	Type here	Type here	Type here	0	Type here %
Umgeni	400kva	10	11	5.6	1	12,836,809 kWh	21,021,040	Type here	Type here	21,021,040	Type here %
Prepaid	771	0	1	5.1	739	4,609,747 kWh	7,917,832	Type here	Type here	7,917,832	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 %
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					**952**	**21,417,624** kWh	**46,903,890**	**0**	**0**	**46,903,890**	

ANNEXURE D – D3: STRATEGY REPORT

DELIVERABLE 3:

STRATEGY DOCUMENT – MANDENI LOCAL MUNICIPALITY (MLM)

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

---

Contract No.: VILP/I/033

Date: 11/08/2022

Version 1

Prepared By:

Leon Prinsloo	
Prasun Seebran	
Martin Piper	

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3.3.3 ***Assess adequacy, effectiveness & efficiency of financial systems*** *11*

3.3.4 ***Assess integrity, completeness & accuracy of energy customer data base*** *11*

3.3.5 ***Review report on Customer Relations Management System and / or Information Systems*** *11*

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3.3.7 ***Investigate necessity of tariff study and review*** *11*

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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 Warehouse
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 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 Mandeni Local Municipality (MLM).

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 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 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 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

- Need for routine maintenance identified
- 6.6 kV equipment to be replaced with 11 kV equipment

3.1.3 General Assessment of Metering & Meter Reading for Bulk purchases

- Umgeni Water POS to be excluded from losses calculations as it skews the picture.
- Total losses generally very low at less than 4%.
- Tariff structure for Mandeni POS to be queried with Eskom.
- Middle of the month to middle of the month billing may lead to administrative errors.
- No check meters to verify accuracy of Eskom billing

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

- Only Umgeni Water LPU customer with a three-party agreement between Umgeni Water, MLM and Eskom.
- Wheeling agreement between MLM and Umgeni Water of 10% markup on Eskom billing.

3.1.5 Roles & Responsibilities

MLM is the licensed provider, for its service areas. The electricity department falls within the technical services and infrastructure development department.

- Electricity provision
    - Need identified for a General Machine Regulations 2(1) responsible person.
    - Need identified for updated structure consisting of three streams:
        - Municipal buildings
        - Reticulation system
        - Street Lighting
- Billing & Revenue
    - Billing & meter reading staff complement of 8.
    - Credit control staff complement of 4.
    - No vacancies were identified.

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
    - No tariff study in recent years may indicate that current tariffs may not be cost reflective.
- Asset Management & Planning
    - Relatively low asset management practice maturity
    - Related to skill challenge & budget constraints
    - Vuthela LED IMQS Asset Management Plan (AMP) is high level AMP with aim to steer MLM towards quality asset management planning
- Budgets for Operations & Maintenance
    - Budgets of approximately R 3.3 million per financial year in 2022/23, 2023/24 and 2024/25. Value approximately 6% of total budgeted costs.

3.1.7 Technical Management Information Systems

Systems identified:

- ESRI ArcGIS for planning & development
- Sage Evolution for financial management & billing (mSCOA compliant)
- Conlog system for prepaid electricity vending
- PayDay software for payroll
- Microsoft: Excel, Projects, Teams etc
- AMS360 asset management software.

Gaps identified:

- SCADA:
    - No current functionality in MLM
    - Solution roadmap presented in separate study, but recommendations not yet implemented.

3.2 Technical losses

- One independent assessment conducted as part of 2019 Mandeni Local Municipality Electricity Master Plan (EMP).
- No real separation of technical & non-technical losses in place.

3.3 Non-technical losses

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

Potential large gap identified between customers having a meter linked to account vs potential customers.

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

No SOPs in place

3.3.3 Assess adequacy, effectiveness & efficiency of financial systems

- Main financial system (Sage Pastel) is mSCOA compliant
- Supplementary prepaid system (Conlog) STS compliant.
- No AMR system in place, however not required.
- 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

- Refer 3.3.1 re potential large gaps identified

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

- Reports 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.
  - Phase 2 to be implemented subject to signing of Memorandum of Agreement

3.3.6 Assess billing & revenue collection re electrical services provision

- Gaps in billing identified resulting from indications that not all electricity meters are in system

3.3.7 Investigate necessity of tariff study and review

- No tariff study has been done in recent times
- A tariff study and review are recommended.

3.3.8 Review completed Indigent register study

A report by 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

Draft ToR in process of being finalized.

Project implementation subject to signing of Memorandum of Agreement

3.3.9 Review of Debt management

- 81% of debtors book 180 days or older.
- Umgeni water biggest debtor but stay current with payments
- Top 25 debtors almost all government institutions (provincial & national)

3.4 Community / End-user Awareness Communication & Campaigns

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

4 STRATEGIES

4.1 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 MLM is already showing total losses of around 3-4%. See below table and graph from the Status Quo report based on NERSA D forms information. Tables are shown including Umgeni Water and also excluding Umgeni water, to illustrate the skewing effect when including Umgeni Water.

Including Umgeni Water

NERSA D FORMS SUMMARY	FINANCIAL YEAR ENDING		
	Jul-19	Jul-20	Jul-21
Energy Purchased in kWh	20,441,858	21,548,189	22,211,843

Energy Sold in kWh	Units	% of Energy bought	Units	% of Energy bought	Units	% of Energy bought
Free basic electricity	0	0.00%	0	0.00%	0	0.00%
Domestic (prepaid)	3,637,913	17.80%	4,053,916	18.81%	4,609,747	20.75%
Domestic (conventional)	4,123,980	20.17%	4,563,258	21.18%	1,466,398	6.60%
Commercial (conventional)		0.00%		0.00%	2,354,670	10.60%
Commercial (prepaid)	0	0.00%	0	0.00%	0	0.00%
Street lighting	131,040	0.64%	193,551	0.90%	150,000	0.68%
Other sales	10,952,766	53.58%	12,088,896	56.10%	12,836,809	57.79%
Total Sales	18,845,699	92.19%	20,899,621	96.99%	21,417,624	96.42%

Total losses in kWh	1,596,159	648,568	794,219
Total losses %	7.81%	3.01%	3.58%

Excluding Umgeni Water

NERSA D FORMS SUMMARY	FINANCIAL YEAR ENDING		
	Jul-19	Jul-20	Jul-21
Energy Purchased in kWh (excl Umgeni wa	9,489,092	9,459,293	9,375,034

Energy Sold in kWh	Units	% of Energy bought	Units	% of Energy bought	Units	% of Energy bought
Free basic electricity	0	0.00%	0	0.00%	0	0.00%
Domestic (prepaid)	3,637,913	17.80%	4,053,916	18.81%	4,609,747	20.75%
Domestic (conventional)	4,123,980	20.17%	4,563,258	21.18%	1,466,398	6.60%
Commercial (conventional)		0.00%		0.00%	2,354,670	10.60%
Commercial (prepaid)	0	0.00%	0	0.00%	0	0.00%
Street lighting	131,040	0.64%	193,551	0.90%	150,000	0.68%
Total Sales	7,892,933	38.61%	8,810,725	40.89%	8,580,815	38.63%

Total losses in kWh	1,596,159	648,568	794,219
Total losses %	16.82%	6.86%	8.47%

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.

4.2 Strategies Overview

This strategy document contains a total of 14 strategies, broken down into:
3 x Technical (T) strategies
4 x Financial (F) strategies
6 x Institutional (I) strategies
1 x Social Intervention (S) strategy.

The table below provides a high-level overview of the strategies.

Strategy nr	Description	Category
T1	Eskom POS Metering assurance	Technical
T2	Technical & Non-technical losses seperation	Technical
T3	Upgrade of 6.6kV networks to 11kV	Technical
F1	Eskom billing administration	Financial
F2	Prepaid customer vending assurance	Financial
F3	Conventional customer billing assurance	Financial
F4	Review of credit control processes & activities	Financial
I1	Intra- & Interdepartmental Standard Operating Procedures	Institutional
I2	Tariff study & review	Institutional
I3	Implementation of single platform iLembe Indigent Management System	Institutional
I4	Implementation of Data Warehousing & Business Intelligence Platform	Institutional
I5	Independent review of NERSA D forms	Institutional
S1	Community Engagement	Social

4.3 Technical Strategies

4.3.1 Strategy T1 – Eskom POS Metering Assurance

4.3.1.1 Strategy Description

MLM previously had a check meter installation at their intake on the 11kV overhead line. This meter was never utilised and has subsequently been stolen. This strategy recommends that the check meter and associated infrastructure be replaced with appropriate security measures place. The check meter will provide assurance and verification of Eskom billing and allow for anomalies to be identified.

4.3.1.2 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	S	O

4.3.1.3 High level scope

The high-level scope for this strategy is highlighted below.

Nr	T1 Eskom POS Metering assurance	
	Scope	Roles & Responsibilities
1	**Mandeni Intake** Reinstate existing vandalised check meter installation Download metering data on monthly basis & compare with Eskom billing data.	Outsourced to service provider

4.3.1.4 Cost Estimation

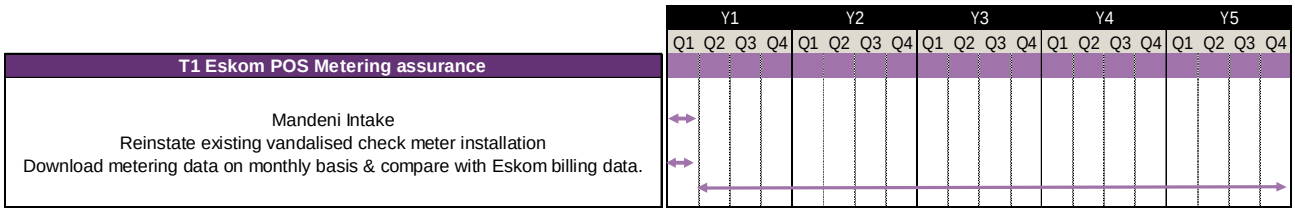
For the cost estimation of this strategy, the following assumptions have been made:

- The existing CT/VT unit onsite is fully functional and only the meter and router need replacement and commissioning.

The table below provides an overview of the associated costs estimate for this strategy.

T1 Eskom POS Metering assurance									
				Annual Quantity					
Contractor / Consultant Costs	Number	Cost/Item		Y1	Y2	Y3	Y4	Y5	Total cost
Replace stolen check meter installation	1	R	40,000	1	0	0	0	0	R 40,000
TOTAL Contractor Costs									R 40,000

4.3.1.5 SMART implementation schedules



4.3.1.6 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 skilled person within electrical department. Manage performance against agreed KPI's

4.3.1.7 Procurement & Implementation options

Procurement & implementation is outsourced.

4.3.2 Strategy T2 – Technical & Non-Technical losses separation

4.3.2.1 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 MLM 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.

The proposed strategy for technical losses is to initially develop an SLD for MLM's supply area that can be used as a basis to conduct a technical loss study. This study will form the base for technical loss assessments going forward. An initial cost will be incurred for consulting services to develop the SLD, modelling of the networks and TL study. The use of external consultants implies an expense for the utility without further technical or administrative skills needed within MLM. The metering required for the study will be provided by the check meter at the intake point and downstream metering will need to be captured periodically and captured into spreadsheets custom designed for this purpose. This base TL estimate can be used on a yearly basis as a benchmark and reviewed once the network has been upgraded.

The modelling does not explicitly include all LV networks however sample networks representative of the MLM 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 MLM 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.

4.3.2.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
T2	Technical & Non-technical losses seperation	Technical	L	L	S	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.

4.3.2.3 High level scope

Nr	T2 Technical & Non-technical losses seperation	
	Scope	Roles & Responsibilities
1	Develop SLD of MLM network at MV and MV/LV distribution level	Outsourced to service provider with support from MLM electricity department
2	Conduct technical loss study – Base. The required metering data can be captured with portable meters during peak periods and captured into spreadsheets custom-designed for this purpose. The LV network loss component to be a sample network representative of the MLM system.	Outsourced to service provider/KDM electricty department
3	Technical Loss Study Update	Outsourced to service provider
4	Develop losses separation methodology	Outsourced to service provider
5	Annual Losses Separation	Outsourced to service provider with support from MLM electricity/finance department

4.3.2.4 Cost Estimation

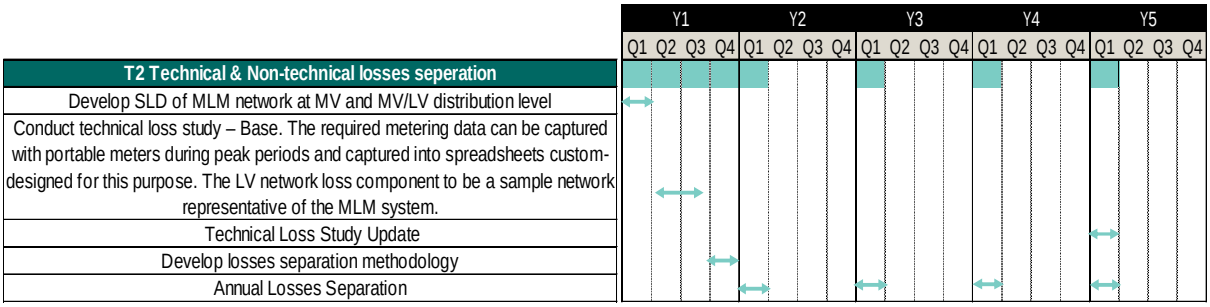
For the cost estimation of this strategy, the following assumptions have been made:

- Consultant hours to develop SLD, R750 per hour at 64 hours
- Consultant hours to build MV model, LV sample networks, calibrate model using metering data and run base TL study, R750 per hour at 240 hours
- Consultant hours to run TL study after 6.6kV network upgrade, R750 per hour at 104 hours
- Consultant hours to develop losses separation methodology, R750 per hour at 208 hours
- Conduct annual losses separation at a cost of R750 per hour at 80 hours

Table below provides and overview of the associate costs against assumed rates over the strategy period.

T2 Technical & Non-technical losses seperation									R	702,000
				Annual Quantity						
Contractor/Consultants	Number	Cost/Item		Y1	Y2	Y3	Y4	Y5	Total cost	
Develop MV SLD to Rx transformers	1	R	48,000	1					R	48,000
Build detail MV model and sample LV model and conduct TL study - Base	1	R	180,000	1					R	180,000
Conduct annual TL study after 6.6kV upgrade	1	R	78,000					1	R	78,000
Develop losses separation methodology	1	R	156,000	1					R	156,000
Conduct annual losses seperation	4	R	60,000		1	1	1	1	R	240,000
TOTAL Contractor/Consultants									R	702,000

4.3.2.5 SMART implementation schedules



4.3.2.6 Risks & Mitigation measures

Nr	T2 Technical & Non-technical losses seperation		
	Risk	Impact	Mitigation
1	Lack of metering data to conduct TL study	This can result in inaccurate TL estimates	Ensure metering data is captured at transformer level periodly using portable meters.
2	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 MLM staff

4.3.2.7 Procurement & Implementation options

Implementation of this strategy will be outsourced toa qualifying service provider with some extent of this strategy being done internally.

4.3.3 Strategy T3 – Upgrade of 6.6kV networks to 11 kV

4.3.3.1 Strategy Description

The town of Mandeni internal network consists of 11kV and 6.6kV equipment. The 6.6kV network is aged, obsolete and continuously fails resulting in reduced performance and reliability. The upgrade of this network will provide a unified voltage level improving voltage regulation and assist with the reduction of technical losses.

It would be ideal to upgrade this network as soon as possible as a single project, however a phased approach has been considered for ease of implementation and to ensure it is affordable to the utility. The phasing is based on the implementation plan identified within the previous MLM EMP, however grouped into 3 phases as opposed to 7 phases. The following can be noted with respect to phasing,

- Phase 1 – Combination of works proposed for 2023 and 2024 within EMP
- Phase 2 – Combination of works proposed for 2024 and 2025 within EMP
- Phase 3 – Combination of works proposed for 2026, 2027 and 2028 within EMP

4.3.3.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
T3	Upgrade of 6.6kV networks to 11kV	Technical	L	L	S	O

4.3.3.3 High level scope

Nr	T3 Upgrade of 6.6kV networks to 11kV	
	Scope	Roles & Responsibilities
1	Planning and Design Phase for the replacement of 6.6kV networks to 11kV	Outsourced to service provider
2	Phased project implementation	Outsourced to service provider

4.3.3.4 Costs Estimation

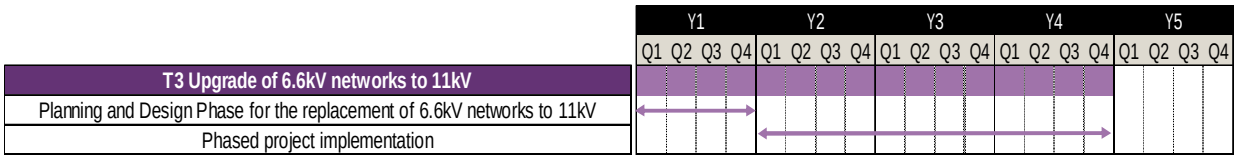
For the cost estimation of this strategy, the following assumptions have been made:

- The project was costed within the 2019 EMP and pricing has been escalated at 5% a year to derive the 2022 cost estimate.
- The planning and design cost is based on 13% of CAPEX cost.

Table below provides and overview of the associate costs against assumed rates over the strategy period.

T3 Upgrade of 6.6kV networks to 11kV										
				Annual Quantity						
Contractor/Consultants	Number	Cost/Item		Y1	Y2	Y3	Y4	Y5	Total cost	
Planning & Design for 6.6kV network replacement	1	R	2,100,000	1					R	2,100,000
Project Implementation phase 1	1	R	4,600,000		1				R	4,600,000
Project Implementation phase 2	1	R	4,600,000			1			R	4,600,000
Project Implementation phase 3	1	R	6,900,000				1		R	6,900,000
TOTAL Equipment & Materials									R	18,200,000

4.3.3.5 SMART implementation schedules



4.3.3.6 Risks & Mitigation measures

Nr	T3 Upgrade of 6.6kV networks to 11kV		
	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 project manage a Capital project of this nature	Poor project delivery	Outsource project management component to consultant or increase capacity within the project management unit
3	Budget constraints as this project has high capital costs	Failure to implement project	Explore funding options available such as National Treasury

4.3.3.7 Procurement & Implementation options

The planning and functional design are recommended to be outsourced to a qualifying service provider and then implementation phases put out to tender. Funding to be sourced from CAPEX or OPEX budgets under maintenance and repairs. However, considering the CAPEX cost in relation to current CAPEX and OPEX budgets it would be better suited to source funding through National Treasury on a grant basis.

4.4 Financial Strategies

4.4.1 Strategy F1 – Eskom billing administration

4.4.1.1 Strategy Description

It was highlighted during the status quo phase that especially Mandeni POS has a questionable billing structure / process requiring intense administration to ensure MLM are being charged correctly by Eskom. Aspects which require scrutiny are:

- The tariff structure of the Mandeni POS and resultant perceived overcharging per GWh.
- Random rebilled adjustments
- Middle of the month to middle of the month billing.

The tariff structure and resultant perceived overcharge per GWh needs to be queried with Eskom as a matter of urgency.

Random rebilled adjustments need to be scrutinized in detail and any issues raised with Eskom immediately

The middle of the month to middle of the month billing may lead to administrative errors at especially financial year end and makes the administration of the billing unnecessary complex. It may even contribute to the rebilled adjustments. A calendar month to calendar month billing process is rather suggested.

4.4.1.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
F1	Eskom billing administration	Financial	H	H	B	I

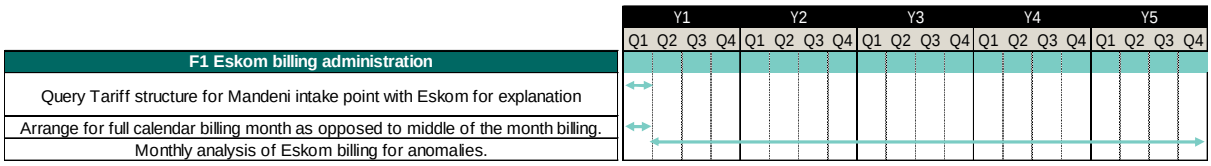
4.4.1.3 High level scope

Nr	F1 Eskom billing administration	
	Scope	Roles & Responsibilities
1	Query Tariff structure for Mandeni intake point with Eskom for explanation	MLM Finance & Electricity dept / Eskom
2	Arrange for full calendar billing month as opposed to middle of the month billing.	MLM Finance & Electricity dept / Eskom
3	Monthly analysis of Eskom billing for anomalies.	MLM Finance & Electricity dept

4.4.1.4 Costs Estimation

As this is just an administrative matter to be addressed between MLM officials and Eskom, no additional costs are projected.

4.4.1.5 SMART implementation schedules



4.4.1.6 Risks & Mitigation measures

Nr	F1 Eskom billing administration		
	Risk	Impact	Mitigation
1	Lack of skills in finance to accurately interrogate and analyse Eskom billing	Billing errors to MLM and Umgeni Water by extension	Skills improvement training of staff in Electrical and finacial department. Scrutinizing by experienced personnel in both departments

4.4.1.7 Procurement & Implementation options

No procurement is required as this will be an internal matter to be addressed between Eskom and MLM.

4.4.2 Strategy F2 – Prepaid customer vending assurance

4.4.2.1 Strategy Description

In the status quo report, it was highlighted that records of only 300 prepaid customers and 160 conventional customers could be obtained, against a potential 4 622 customers, being the stands in Mandini and Sundumbili towns supplied MLM. Other areas within MLM are supplied directly by Eskom where applicable.

There is a real risk that meters are in the field but not in the system, leaving customers to be getting electricity for free.

An intervention is needed where MLM will have a clear indication per registered stand, whether the stand is supplied by Eskom, conventional metering, or prepaid metering.

Prepaid vending assurance in our estimation involves the following steps:

- Data clean-up and mirroring of Sage Pastel financial system and Conlog prepaid system information
- Flagging in the system of stands supplied by Eskom.
- Auditing of stands with no record of a meter and ensuring meter uploaded to system(s). (This cut across conventional metering assurance as well).
- Auditing of meters showing no purchasing for more than 90 days. This is currently under way with an appointed service provider; however, indications are that it is not reaping the required results and require a possible review of the ToR of the appointed service provider to determine if the deliverables address the needs of MLM.
- Monthly ongoing data analysis of purchasing history, auditing of meters with no purchases for 90 days.
- Fining of consumers tampering with meters, back billing calculations and compiling of report for finance department to levy against consumer account.

4.4.2.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
F2	Prepaid customer vending assurance	Financial	M	M	B	O

4.4.2.3 High level scope

Nr	F2 Prepaid customer vending assurance	
	Scope	Roles & Responsibilities
1	Data clean-up and mirroring of Sage Pastel financial system and Conlog Prepaid system information	External consultant
2	Flagging of Eskom supplied stands in Financial system	External consultant / Finance department
3	Auditing of non-Eskom supplied stands with no record of a meter	External consultant
4	Auditing of meters showing no purchasing for more than 90 days	External consultant
5	Monthly ongoing data analysis of purchasing history, auditing of meters with no purchases for 90 days.	External consultant
6	Targeted audits of areas where meters show purchases lower than the expected benchmark for the specific area	External consultant
7	Fining of consumers tampering with meters, back billing calculations and compiling of report for finance department to levy against consumer account	External consultant

4.4.2.4 Costs Estimation

For the cost estimation of this strategy, the following assumptions have been made:

- 1000 Stands to be audited having no meter in the system at R 300 per stand.
- 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.

F2 Prepaid customer vending assurance								R 500,000
			Annual Value					
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
Audit stands with no meter	1,000	R 300	1,000					R 300,000
Audit stands with no purchase 90 days								R -
Audit stands low purchase targeted areas								R -
Back-billing calculation & report compilation	200	R 1,000.00	200					R 200,000
TOTAL Contractor / Consultant Costs								R 500,000

4.4.2.5 SMART implementation schedules

F2 Prepaid customer vending assurance	Y1 Q1	Y1 Q2	Y1 Q3	Y1 Q4	Y2 Q1	Y2 Q2	Y2 Q3	Y2 Q4	Y3 Q1	Y3 Q2	Y3 Q3	Y3 Q4	Y4 Q1	Y4 Q2	Y4 Q3	Y4 Q4	Y5 Q1	Y5 Q2	Y5 Q3	Y5 Q4
Data clean-up and mirroring of Sage Pastel financial system and Conlog Prepaid system information	↔																			
Flagging of Eskom supplied stands in Financial system	↔																			
Auditing of non-Eskom supplied stands with no record of a meter		↔																		
Auditing of meters showing no purchasing for more than 90 days		↔	→																	
Monthly ongoing data analysis of purchasing history, auditing of meters with no purchases for 90 days.					↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Targeted audits of areas where 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					↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔

4.4.2.6 Risks & Mitigation measures

Nr	F2 Prepaid customer 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 ongoing 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

4.4.2.7 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.

4.4.3 Strategy F3 – Conventional SPU customer billing assurance

4.4.3.1 Strategy Description

As highlighted under F2, there are concerns that meters may be in the field but not in the system, leaving customers to potentially be getting electricity for free.

It was also highlighted that an intervention is needed where MLM will have a clear indication per registered stand, whether the stand is supplied by Eskom, conventional metering, or prepaid metering.

In the case of conventional metering, metering assurance can be extended to improved percentage readings onto bill, or put another way, meters that are not interim billed or estimated. Interim or estimated billing 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.

Conventional metering assurance is proposed to involve the following steps:

- Flagging in the system of stands supplied by Eskom.
- Auditing of stands with no record of a meter and ensuring meter uploaded to system(s). (This cut across prepaid metering assurance as well).
- Auditing of meters being interim billed
- Monthly inspections of meters appearing on the faulty meters list and appropriate remedial action (meter repair / replacement).
- This strategy can also benefit from a community awareness programme linked a call centre / 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.

4.4.3.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
F3	Conventional customer billing assurance	Financial	M	L	B	O

4.4.3.3 High level scope

Nr	F3 Conventional customer billing assurance	
	Scope	Roles & Responsibilities
1	Auditing of non-Eskom supplied stands with no record of a meter	External consultant
2	Auditing of meters being estimated	External consultant
3	Inspections of meters appearing on the faulty meters list & appropriate remedial action	External consultant
4	Consumer awareness campaign to submit meter readings	External consultant

4.4.3.4 Costs 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.
- Contractor to audit approximate 500 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 new meter cost at R 1000 per meter.

F3 Conventional customer billing assurance								R 475,000
			Annual Quantity					
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
Audit meters not being billed	500	R 300	500					R 150,000
Replace faulty meters	250	R 300	250					R 75,000
								R -
TOTAL Contractor / Consultant Costs								R 225,000

			Annual Quantity					
Equipment & Materials	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost
Meters	250	R 1,000	250					R 250,000
								R -
TOTAL Other Costs								R 250,000

4.4.3.5 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
F3 Conventional customer billing assurance																				
Auditing of non-Eskom supplied stands with no record of a meter	←		→																	
Auditing of meters being estimated	←			→																
Inspections of meters appearing on the faulty meters list & appropriate remedial action	←											→								
Consumer awareness campaign to submit meter readings	←											→								

4.4.3.6 Risks & Mitigation measures

Nr	F3 Conventional SPU customer billing assurance		
	Risk	Impact	Mitigation
1	Lack / shortage of skills to inspect meters on fault list and implement timeous remedial action	Estimated accounts remain high	Outsourcing to external consultant
2	Insufficient budget for material purchases and maintenance	Estimated accounts remain high	Ensure sufficient operational budget

4.4.3.7 Procurement & Implementation options

It is recommended that this strategy be outsourced to an external consultant.

4.4.4 Strategy F4 – Review of credit control processes & activities

4.4.4.1 Strategy Description

It was highlighted in the status quo report that **81% of the debtor book is 180 days or older. Major interventions are needed to ensure vastly improved collection rates for MLM.**

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 if 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.
- Manage data through the proposed Data Warehouse and Business Intelligence platform for complete record purposes and performance reporting

4.4.4.2 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 / O

4.4.4.3 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

4.4.4.4 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.

F4 Review of credit control processes & activities								R	1,537,200
			Annual Quantity						
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5		Total cost
Delivering of final notices	7320	R 50	3000	2400	1920			R	366,000
Disconnection of defaulters	3660	R 200	1500	1200	960			R	732,000
Reconnection of customers that paid	2196	R 200	900	720	576			R	439,200
TOTAL Contractor / Consultant Costs								R	1,537,200

4.4.4.5 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	←											→								

4.4.4.6 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

4.4.4.7 Procurement & Implementation options

Procurement can be considered to be outsourced on a risk - reward model where an external consultant gets rewarded based on successful collection of revenue from the credit control activities.

4.5 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.

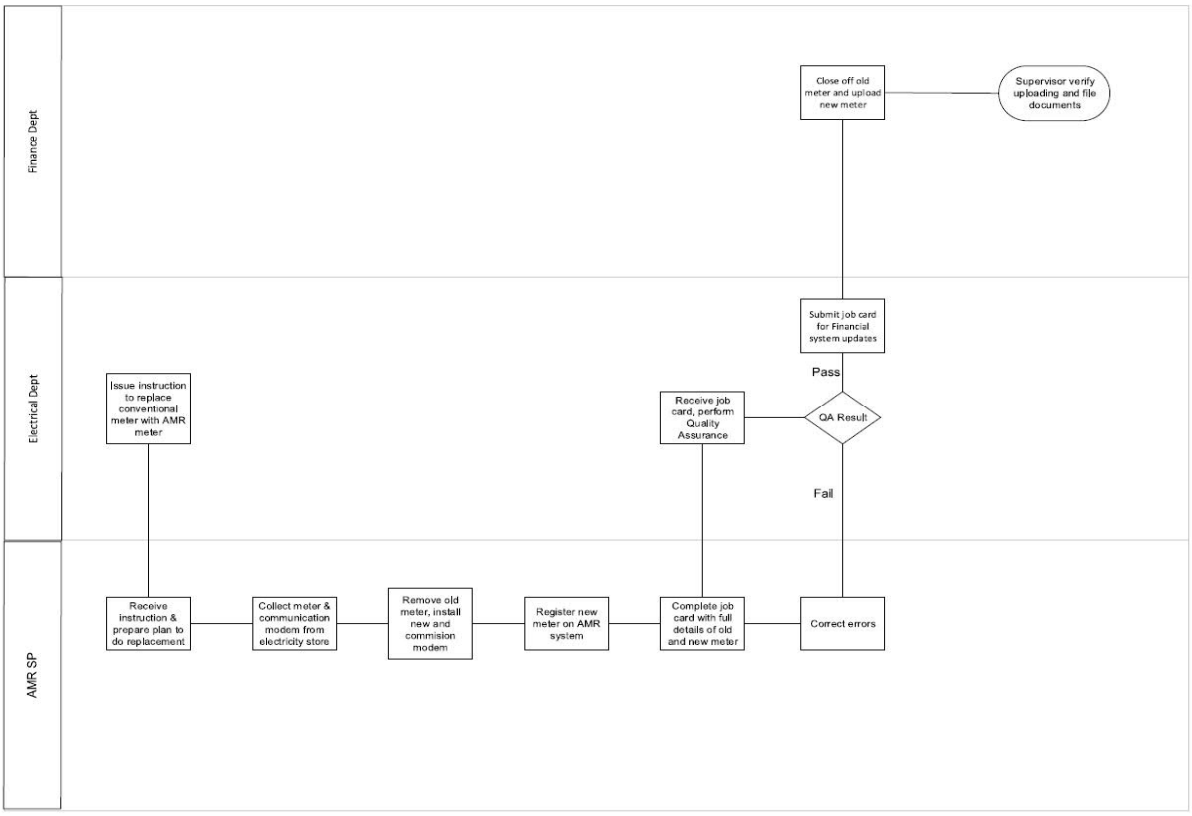
4.5.1 Strategy I1 – Intra- & Interdepartmental Standard Operating Procedures enhancement

4.5.1.1 Strategy Description

This strategy is aimed at improving cooperation intra- and inter department, as well as external service providers if any.

The strategy is proposed to contain the following elements:

- Process flow procedures with “Swimlanes” 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

4.5.1.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
I1	Intra- & Interdepartmental Standard Operating Procedures	Institutional	M	M	B	O / I

4.5.1.3 High level scope

Nr	I1 Intra- & Interdepartmental Standard Operating Procedures	
	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	External consultant
4	Manage performance accordingly	Internal

4.5.1.4 Cost Estimation

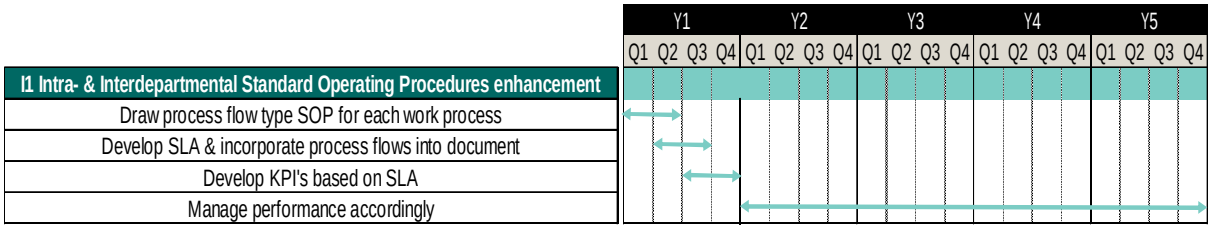
For the cost estimation of this strategy, the following assumptions have been made:

- 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	

4.5.1.5 SMART implementation schedules



4.5.1.6 Risks & Mitigation measures

Nr	I1 Intra- & Interdepartmental Standard Operating Procedures		
	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

4.5.1.7 Procurement & Implementation options

It is recommended that an external Organizational Development consultant be procured for this intervention.

4.5.2 Strategy I2 – Tariff study & review

4.5.2.1 Strategy Description

It was highlighted in the status quo that a tariff study and review have not been done for some time.

Add to that the tariff structure applied by Eskom on the Mandeni POS which requires intervention with Eskom, then it is highly recommended that a tariff study and review be implemented.

It is recommended that this strategy be outsourced to an experienced service provider, appointed through a tender process.

The strategy is recommended to contain the following steps:

- Drawing up of tender document with defined scope and deliverables.
- Appoint service provider to conduct tariff study and review (expected to not take longer than three months)
- Implement recommended practices

4.5.2.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
I2	Tariff study & review	Institutional	L	L	S	O

4.5.2.3 High level scope

Nr	I2 Tariff study & review	
	Scope	Roles & Responsibilities
1	Draw up tender document with defined scope and deliverables	Internal / National Treasury
2	Appoint Service provider	Internal / National Treasury
3	Service provider conducts study and review and provide report with practice recommendations	External consultant
4	Implement recommended practices	Internal

4.5.2.4 Costs Estimation

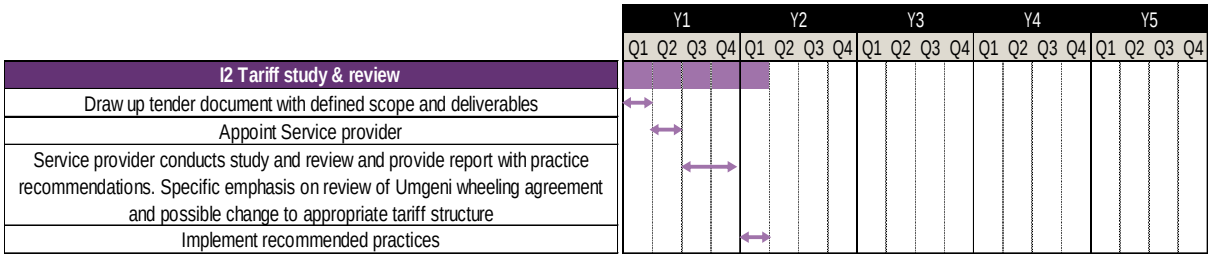
For the cost estimation of this strategy, the following assumptions have been made:

- 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

4.5.2.5 SMART implementation schedules



4.5.2.6 Risks & Mitigation measures

Nr	I2 Tariff study & review		
	Risk	Impact	Mitigation
1	Budget constraints to fund strategy	Failure to implement strategy	Apply funding from National Treasury (LGBA)
2	Under performing consultant	Sub-standard recommendations for implementation	Enure clearly defined scope, deliverables, and performance management clauses
3	Failure to implement recommended practices	Strategy failure, impacting optimal implentation of other strategies	Ensure implementation by linking resonsiblities to roles and link KPI's

4.5.2.7 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.

4.5.3 Strategy I3 – Implementation of single platform iLembe Indigent Management System

4.5.3.1 Strategy Description

This strategy is 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 iLembe District municipality as well as the four local municipalities located within its borders, namely Mandeni, KwaDukuza, Maphumulo and Ndwedwe. 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 ToR's 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.

4.5.3.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
I3	Implementation of single platform iLembe Indigent Management System	Institutional	L	L	B	O

4.5.3.3 High level scope

Nr	I3 Implementation of single platform iLembe Indigent Management System	
	Scope	Roles & Responsibilities
1	Drawing up of ToR for role stakeholder input.	Vuthela / Internal
2	Signing of MOA	Vuthela / Internal
3	Procure & Implement IS system	Internal / Service provider
4	Annual review of register	Internal

4.5.3.4 Costs Estimation

The cost for this strategy is a PFM cost and is shown for information purposes.

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

4.5.3.5 SMART implementation schedules

I3 Implementation of single platform iLembe Indigent Management 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
Drawing up of ToR for role stakeholder input.	↔																			
Signing of MOA	↔																			
Procure & Implement IS system		↔																		
Annual review of register					↔				↔				↔				↔			

4.5.3.6 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

4.5.3.7 Procurement & Implementation options

This strategy also falls under the Vuthela EMP projects and therefore will be procured from Vuthela EMP budgets.

4.5.4 Strategy I4 – Implementation of Data Warehousing and Business Intelligence platforms

4.5.4.1 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.

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.

Data from the following systems to be gathered and stored in a Data Warehousing system.

- Conventional metered customer metering data from the Sage Pastel Financial System
- Prepaid meter customer data from the Conlog vending system.

- Customer management system data (part of Vuthela LED programme)
- Financial Asset register information from Sage Patel financial system
- AMS 360 Asset management system
- Geographical Information System (GIS)

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 system such as Prepaid meter data system.

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 MLM 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.

4.5.4.2 Strategy Matrix

Strategy nr	Description	Category	Priority Matrix			
			Impact	Quick Win	Funding Availability	Technical Capacity
I4	Implementation of Data Warehousing & Business Intelligence Platform	Institutional	M	L	S	O

4.5.4.3 High level scope

Nr	I4 Implementation of Data Warehousing & Business Intelligence Platform	
	Scope	Roles & Responsibilities
1	**Data Warehousing** Establish needs & Design system Determine cost & budget accordingly Procure system adressing specific needs Implementation & training	Internal / Outsourced
2	**Business Intelligence** Establish needs & Design system Determine cost & budget accordingly Procure system that addresses needs Implementation & training	Internal / Outsourced

4.5.4.4 Cost 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.

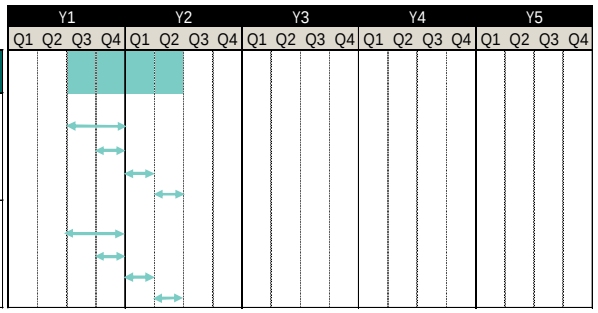
Table below provides an overview of the associate costs against assumed rates over the strategy period.

I4 Implementation of Data Warehousing & Business Intelligence Platform									R	5,625,000
			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

4.5.4.5 SMART implementation schedules

I4 Implementation of Data Warehousing & Business Intelligence Platform
Data Warehousing
Establish needs & Design system
Determine cost & budget accordingly
Procure system adressing specific needs
Implementation & training
Business Intelligence
Establish needs & Design system
Determine cost & budget accordingly
Procure system that addresses needs
Implementation & training



4.5.4.6 Risks & Mitigation measures

Nr	I5 Implementation of Data Warehousing & Business Intelligence (BI) platforms		
	Risk	Impact	Mitigation
1	Budget constraints to fund strategy	Failure to implement strategy	Thorough needs analysis, design and costing for budget pruoses in folloiwng financial year procurement
2	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
3	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.

4.5.4.7 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.

4.5.5 Strategy I5 – Independent review of NERSA D forms

4.5.5.1 Strategy Description

The aim of this strategy is to assist MLM in validating the D forms submitted for the last three years, assistance with accurately compiling the 2022 D forms and skills transfer to accurately complete internally going forward.

4.5.5.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
I5	Independent review of NERSA D forms	Institutional	L	L	S	O

4.5.5.3 High level scope

Nr	I5 Independent review of NERSA D forms	
	Scope	Roles & Responsibilities
1	Review of D forms for past 3 years	Internal / Outsourced
2	Assistance with compilation of D forms for FY 2022	Outsourced
3	Skills transfer to internal resource(s)	Outsourced

4.5.5.4 Cost Estimation

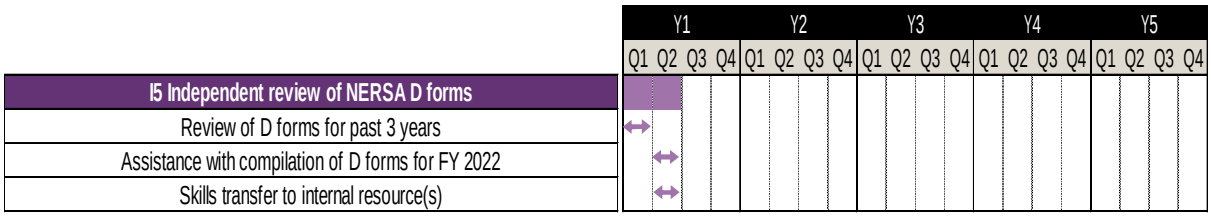
For the cost estimation of this strategy, the following assumptions have been made:

- Consultant hours to review previous 3 years D Forms = 150 hours.
- Consultant hours to compile 2022 D forms = 100 hours.
- Consultant hours to transfer skill = 50 hours.
- Consultant rate per hour = R 700.

Table below provides an overview of the associate costs against assumed rates over the strategy period

I5 Independent review of NERSA D forms									
			Annual Quantity						
Contractor / Consultant Costs	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5	Total cost	
Review of D forms for past 3 years	150	R 700	150					R	105,000
Assistance with compilation of D forms for FY 2022	100	R 700	100					R	70,000
Skills transfer to internal resource(s)	50	R 700	50					R	35,000
								R	-
								R	210,000

4.5.5.5 SMART implementation schedules



4.5.5.6 Risks & Mitigation measures

Nr	I5 Independent review of NERSA D forms		
	Risk	Impact	Mitigation
1	Poor performing consultant	Failure / delays to implement strategy	Enure clearly defined scope, deliverables, and performance management clauses

4.5.5.7 Procurement & Implementation options

The strategy is recommended to be outsourced to an experienced consultant. It is assumed that funds have not been budgeted and should therefore be sourced, or alternatively budgeted for the next financial year. It is however recommended that the strategy be implemented sooner than later.

4.6 Social Intervention & Initiatives

4.6.1 Strategy S1 - Community Engagement

4.6.1.1 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 MLM NRE management strategy. The community engagement strategy includes 3 initiatives, namely, the creation of an awareness campaign, ward-level NRE strategy management representative forums and a communication channel. The 3 initiatives are outlined below:

A. Establishment of an awareness campaign

MLM 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 MLM. The main purpose of the awareness campaign should be to:

- Inform and educate communities with MLM 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.

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, LinkedIn, 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

MLM does not have any forums aimed at advocating for the aims and objectives of the NRE management strategy. The KMLM has 18 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 local 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 MLM and the communities within MLM, 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 1** 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.

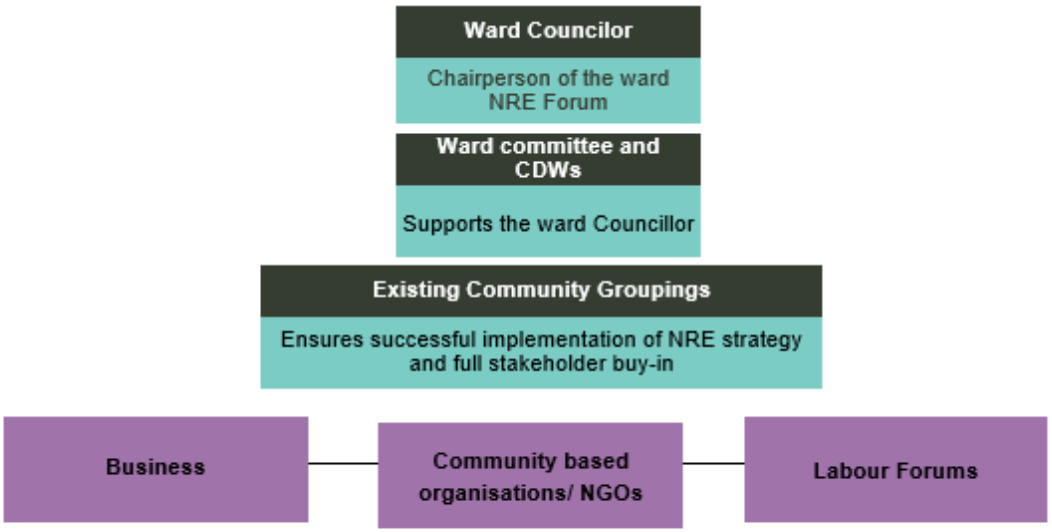


Figure 1: Proposed Structure of the NRE Strategy representative ward forums

4.6.1.2 Strategy Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
S1	Community Engagement	Social	L	M	B	O

4.6.1.3 High level scope

Nr	S1 Community Engagement	
	Scope	**Roles & Responsibilities**
	Appoint qualified Client Liaison Officer	Internal
2	**Ward level NRE strategy representative forums** Development of forum constitution Announcement of establishment of Ward forums Execution of Ward forum activities (meetings etc)	Internal

4.6.1.4 Cost Estimation

The cost estimation presented is based on the following assumptions:

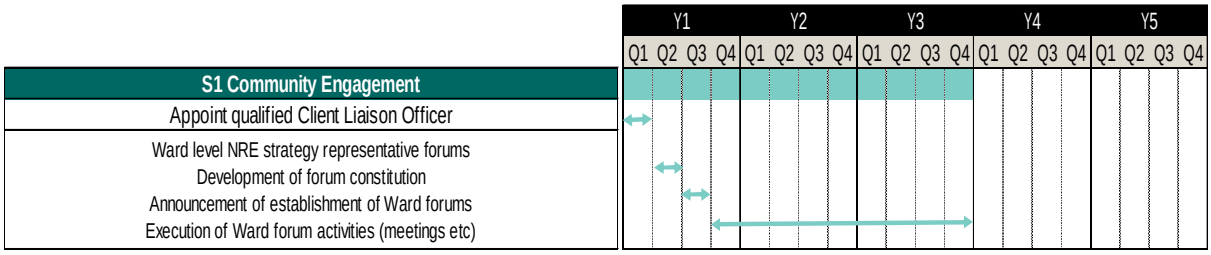
- The appointed MLM stakeholder engagement specialist will work 10040 hours over a period of 5 years, with an annual salary of R 528 000.
- One senior social consultant will work on the conceptualisation of an awareness campaign and develop a campaign awareness strategy.
- Two senior social consultants will work on the implementation of the strategy
- Two senior consultants will work on the monitoring and evaluation of the campaign indicators
- Two senior consultants will work on the development of the ward forum constitution
- 4 senior consultants will work on the planning and facilitation of forum meetings
- The service provider to place comments and suggestion boxes in the 18 wards within MLM will require 130 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 3,410,000
			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	100					R 50,000
Implement strategy	2	R 500	100	50	50			R 100,000
Monitor & evaluate campaign	2	R 500	100	50	50			R 100,000
Ward forum constitution development	1	R 500	80					R 40,000
Ward forum meetings planning & facilitation	2	R 500	80	50	50			R 90,000
Placing of comments / suggestion boxes	1	R 3,000	130					R 390,000
TOTAL Other Costs								R 770,000

4.6.1.5 SMART implementation schedules



4.6.1.6 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	MLM 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

4.6.1.7 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 MLM and respective ward councillors within MLM.

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.

5 Strategy Summary

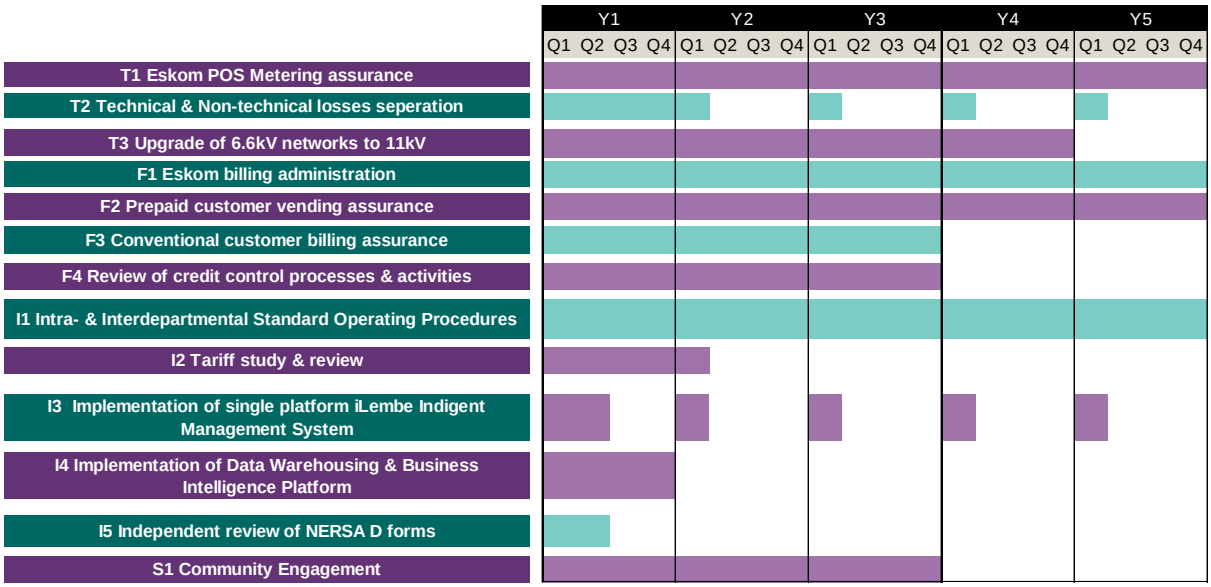
This section aims to provide a holistic overview of the strategies presented in the previous section, highlighting the following aspects.

- Priority Matrix
- Timeline Overview
- Estimated cost summary.

5.1 Priority Matrix

			Priority Matrix			
Strategy nr	Description	Category	Impact	Quick Win	Funding Availability	Technical Capacity
T1	Eskom POS Metering assurance	Technical	L	L	S	O
T2	Technical & Non-technical losses seperation	Technical	L	L	S	I/O
T3	Upgrade of 6.6kV networks to 11kV	Technical	L	L	S	O
F1	Eskom billing administration	Financial	H	H	B	I
F2	Prepaid customer vending assurance	Financial	M	M	B	O
F3	Conventional customer billing assurance	Financial	M	L	B	O
F4	Review of credit control processes & activities	Financial	L	L	B	I / O
I1	Intra- & Interdepartmental Standard Operating Procedures	Institutional	M	M	B	O / I
I2	Tariff study & review	Institutional	L	L	S	O
I3	Implementation of single platform iLembe Indigent Management System	Institutional	L	L	B	O
I4	Implementation of Data Warehousing & Business Intelligence Platform	Institutional	M	L	S	O
I5	Independent review of NERSA D forms	Institutional	L	L	S	O
S1	Community Engagement	Social	M	L	B	O

5.2 Timeline Overview



5.3 Costs Summary

Project	Reference	Budgeted / To be Sourced / Vuthela	Cost
T1 Eskom POS Metering assurance	4.3.1.4	S	R 40,000
T2 Technical & Non-technical losses seperation	4.3.2.4	S	R 702,000
T3 Upgrade of 6.6kV networks to 11kV	4.4.3.4	S	R 18,200,000
F1 Eskom billing administration	4.4.1.4	B	R -
F2 Prepaid customer vending assurance	4.4.2.4	B	R 500,000
F3 Conventional customer billing assurance	4.4.3.4	B	R 475,000
F4 Review of credit control processes & activities	4.4.4.4	B	R 1,537,200
I1 Intra- & Interdepartmental Standard Operating Procedures	4.5.1.4	B	R 420,000
I2 Tariff study & review	4.5.2.4	S	R 780,000
I3 Implementation of single platform iLembe Indigent Management System	4.5.3.4	V	R 3,510,000
I4 Implementation of Data Warehousing & Business Intelligence Platform	4.5.4.4	S	R 5,625,000
I5 Independent review of NERSA D forms	4.5.5.4	S	R 210,000
S1 Community Engagement	4.6.1.4	B	R 3,410,000
Totals			R 35,409,200