



DELIVERABLE 3:

STRATEGY DOCUMENT – MANDENI LOCAL
MUNICIPALITY (MLM)

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

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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

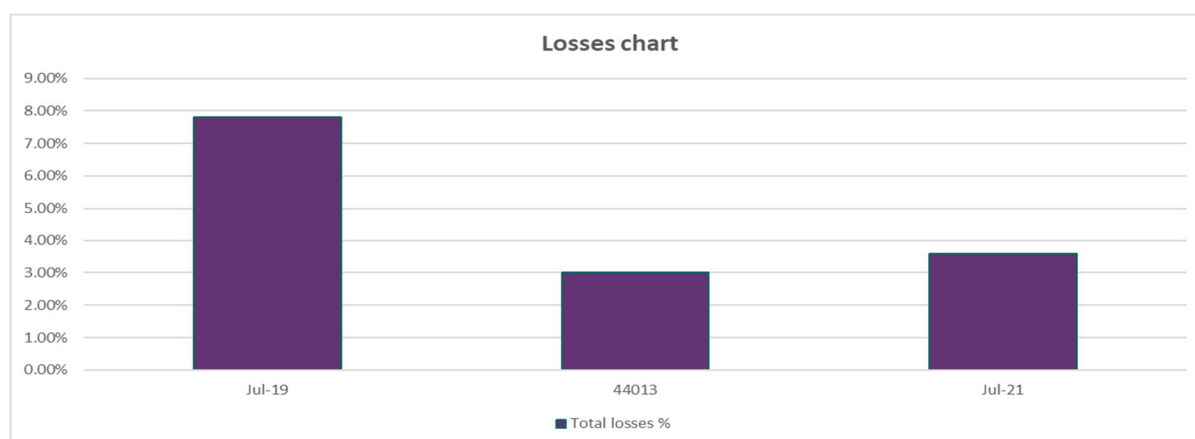
The strategies presented in this section of the document, are not aimed at addressing all the gaps identified during the status quo process. We aim to provide strategies that will have the highest impact, especially strategies that can target “low hanging” fruit.

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 YEARENDING					
	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 separation	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 - **Low** (0-1%), **Medium** (1-2%), **High** (> 2%)
- Quick win – Ability of the strategy to provide significant impact on loss reduction over a short-term period (12 months) – **High** impact or **Low** impact
- Funding Availability – Has funding been **Budgeted** for, or should funding be **Sourced**?
- Technical Capacity – Does the municipality have the capacity available **In-house**, or should **Outsourcing** be considered

The Priority matrix for this strategy is indicated below.

Strategy nr	Description	Category	Priority Matrix			
			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.

T1 Eskom POS Metering assurance		
Nr	Scope	Roles & Responsibilities
1	<p>Mandeni Intake</p> <p>Reinstate existing vandalised check meter installation</p> <p>Download metering data on monthly basis & compare with Eskom billing data.</p>	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		R	40,000					
Contractor / Consultant Costs	Number	Cost/Item	Annual Quantity					
			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

T1 Eskom POS Metering assurance	Y1		Y2		Y3		Y4		Y5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<p>Mandeni Intake</p> <p>Reinstate existing vandalised check meter installation</p> <p>Download metering data on monthly basis & compare with Eskom billing data.</p>	←		←		←		←		←		←	

4.3.1.6 Risks & Mitigation measures

T1 Eskom POS Metering assurance			
Nr	Risk	Impact	Mitigation
1	Commercially non-compliant service provider / under performing service provider	Scheduling delays / poor quality workmanship	Ensure strict 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 & wasteful 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

Strategy nr	Description	Category	Priority Matrix			
			Impact	Quick Win	Funding Availability	Technical Capacity
T2	Technical & Non-technical losses separation	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 separation	
	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 electricity 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 an overview of the associated costs against assumed rates over the strategy period.

T2 Technical & Non-technical losses separation						R	702,000	
Contractor/Consultants	Number	Cost/Item	Annual Quantity					Total cost
			Y1	Y2	Y3	Y4	Y5	
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 separation	4	R 60,000		1	1	1	1	R 240,000
TOTAL Contractor/Consultants							R	702,000

4.3.2.5 SMART implementation schedules

T2 Technical & Non-technical losses separation	Y1		Y2		Y3		Y4		Y5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Develop SLD of MLM network at MV and MV/LV distribution level	←											
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				←		←		←		←		←

4.3.2.6 Risks & Mitigation measures

T2 Technical & Non-technical losses separation		
Nr	Risk	Mitigation
1	Lack of metering data to conduct TL study	Ensure metering data is captured at transformer level periodically using portable meters.
2	Lack of internal capacity and training to capture required statistics to categorise NTL components based on losses separation methodology	Challenge in identifying source of losses resulting in limited success of revenue recovery

4.3.2.7 Procurement & Implementation options

Implementation of this strategy will be outsourced to a 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

Strategy nr	Description	Category	Priority Matrix			
			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

T3 Upgrade of 6.6kV networks to 11kV		
Nr	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 an overview of the associated costs against assumed rates over the strategy period.

T3 Upgrade of 6.6kV networks to 11kV							R	18,200,000
Contractor/Consultants	Number	Cost/Item	Annual Quantity					Total cost
			Y1	Y2	Y3	Y4	Y5	
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

	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
T3 Upgrade of 6.6kV networks to 11kV	[Gantt chart showing implementation phases]																			
Planning and Design Phase for the replacement of 6.6kV networks to 11kV	←→																			
Phased project implementation					←→															

4.3.3.6 Risks & Mitigation measures

T3 Upgrade of 6.6kV networks to 11kV			
Nr	Risk	Impact	Mitigation
1	Commercially non-compliant service provider / under performing service provider	Scheduling delays / poor quality workmanship	Ensure strict 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

Strategy nr	Description	Category	Priority Matrix			
			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

F1 Eskom billing administration	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
Query Tariff structure for Mandeni intake point with Eskom for explanation	←	→																		
Arrange for full calendar billing month as opposed to middle of the month billing.	←	→																		
Monthly analysis of Eskom billing for anomalies.	←	→																		

4.4.1.6 Risks & Mitigation measures

F1 Eskom billing administration			
Nr	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 financial 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

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

4.4.2.3 High level scope

F2 Prepaid customer vending assurance		
Nr	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 an overview of the associate costs against assumed rates over the strategy.

F2 Prepaid customer vending assurance								R	500,000
Contractor / Consultant Costs	Number	Cost/Item	Annual Value					Total cost	
			Y1	Y2	Y3	Y4	Y5		
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

	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
F2 Prepaid customer vending assurance																				
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 prepaid 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, especially 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

Strategy nr	Description	Category	Priority Matrix			
			Impact	Quick Win	Funding Availability	Technical Capacity
F3	Conventional customer billing assurance	Financial	M	L	B	0

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

Equipment & Materials			Annual Quantity					Total cost	
	Number	Cost/Item	Y1	Y2	Y3	Y4	Y5		
Meters	250	R 1,000	250					R	250,000
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
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 of final notices
 - Management of disconnections
 - Management of revisits
 - Management of reconnections

- Implement use of digital technology for credit control quality assurance and performance management. Replace paper process with recording of completed activities on mobile devices with photo proof.
- Manage data through the proposed Data Warehouse and Business Intelligence platform for complete record purposes and performance reporting

4.4.4.2 Strategy Matrix

Strategy nr	Description	Category	Priority Matrix			
			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 technology 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 an overview of the associate costs against assumed rates over the strategy period.

F4 Review of credit control processes & activities							R	1,537,200
Contractor / Consultant Costs	Number	Cost/Item	Annual Quantity					Total cost
			Y1	Y2	Y3	Y4	Y5	
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 technology for activities execution and quality control	←				←				←											
Manage processes through proposed Data & Workforce Management system	←				←				←											

4.4.4.6 Risks & Mitigation measures

F4 Review of credit control processes & activities			
Nr	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.

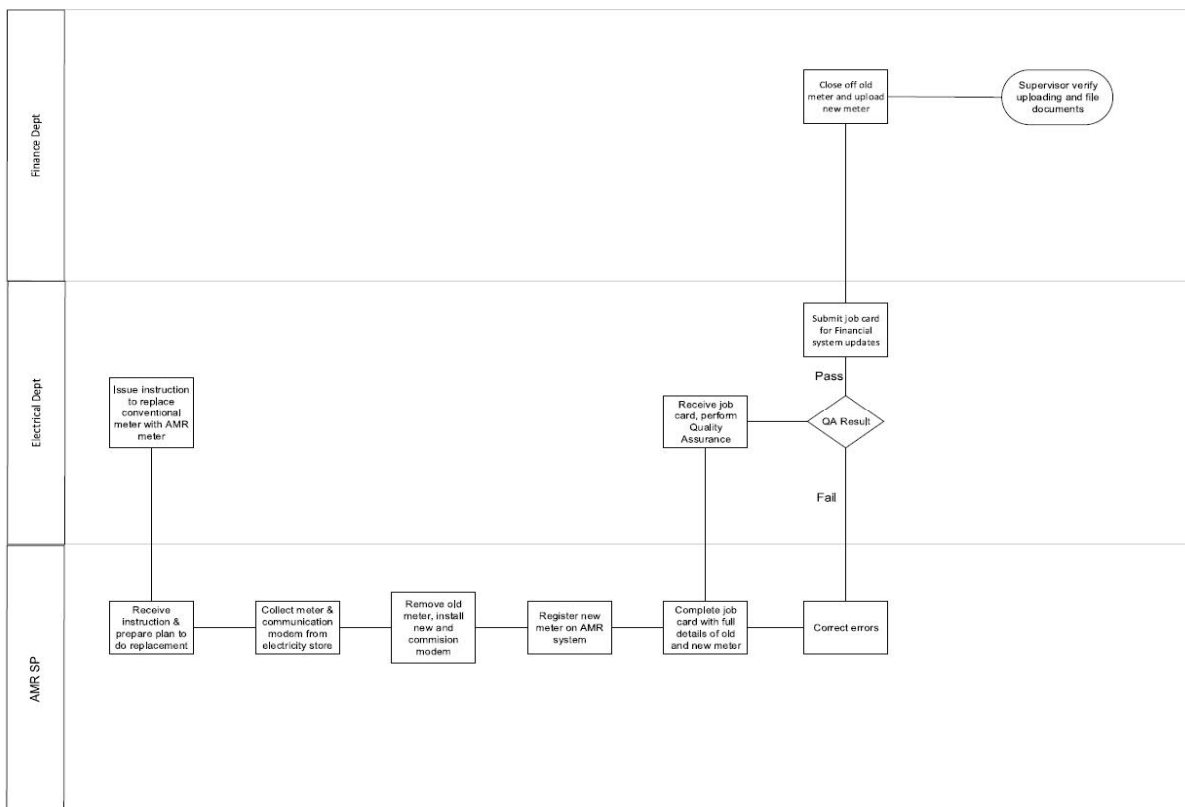
4.5.1 Strategy I1 – Intra- & Interdepartmental Standard Operating Procedures enhancement

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

Strategy nr	Description	Category	Priority Matrix			
			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 an 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

	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
I1 Intra- & Interdepartmental Standard Operating Procedures enhancement	[Timeline bar]																			
Draw process flow type SOP for each work process	←→																			
Develop SLA & incorporate process flows into document	←→																			
Develop KPI's based on SLA	←→																			
Manage performance accordingly					←→															

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

Strategy nr	Description	Category	Priority Matrix			
			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 an overview of the associate costs against assumed rates over the strategy period.

I2 Tariff study & review								R	780,000
Contractor / Consultant Costs	Number	Cost/Item	Annual Quantity					Total cost	
			Y1	Y2	Y3	Y4	Y5		
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

	Y1				Y2				Y3				Y4				Y5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
I2 Tariff study & review																				
Draw up tender document with defined scope and deliverables	←→																			
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	←→																			
Implement recommended practices					←→															

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	Ensure clearly defined scope, deliverables, and performance management clauses
3	Failure to implement recommended practices	Strategy failure, impacting optimal implementation of other strategies	Ensure implementation by linking responsibilities 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

Strategy nr	Description	Category	Priority Matrix			
			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

	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		
I3 Implementation of single platform iLembe Indigent Management System																						
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-shelf BI solutions exist 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 therefore 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

I4 Implementation of Data Warehousing & Business Intelligence Platform		
Nr	Scope	Roles & Responsibilities
1	Data Warehousing Establish needs & Design system Determine cost & budget accordingly Procure system addressing 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
Software Cost - DWH			Number	Cost/Item	Annual Quantity					Total cost	
					Y1	Y2	Y3	Y4	Y5		
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

Software Cost - BI				Annual Quantity					Total cost		
		Qty	Cost/Item	Y1	Y2	Y3	Y4	Y5			
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	R	750,000	
Cloud hosting (MS Azure)		5	R	150,000	1	1	1	1	R	750,000	
TOTAL Software Cost - BI										R	1,875,000

4.5.4.5 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
I4 Implementation of Data Warehousing & Business Intelligence Platform																				
Data Warehousing																				
Establish needs & Design system																				
Determine cost & budget accordingly																				
Procure system addressing 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 prouces in following 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, ragatively 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

Strategy nr	Description	Category	Priority Matrix			
			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								R	210,000
Contractor / Consultant Costs	Number	Cost/Item	Annual Quantity					Total cost	
			Y1	Y2	Y3	Y4	Y5		
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

	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
I5 Independent review of NERSA D forms																				
Review of D forms for past 3 years	←	←																		
Assistance with compilation of D forms for FY 2022		←	←																	
Skills transfer to internal resource(s)		←	←																	

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.

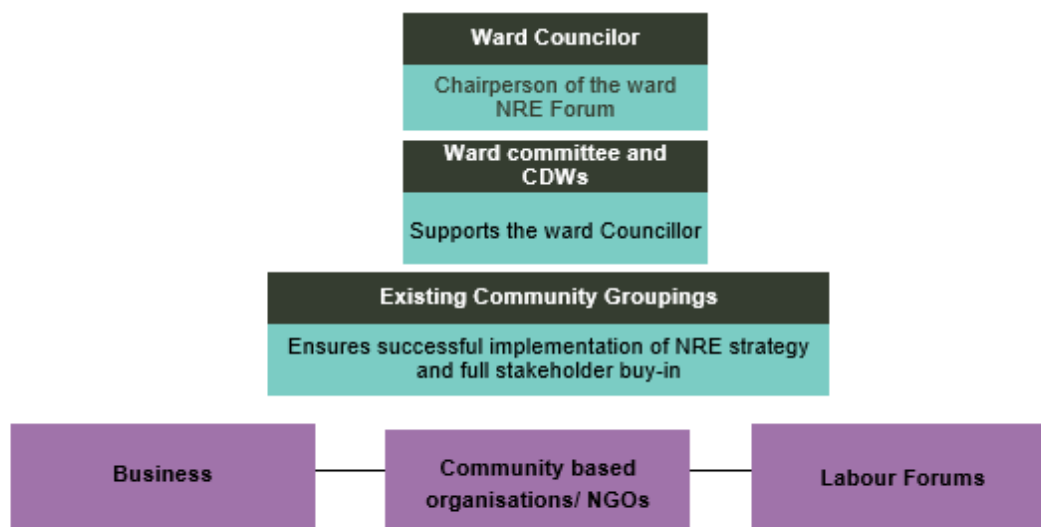


Figure 1: Proposed Structure of the NRE Strategy representative ward forums

4.6.1.2 Strategy Matrix

Strategy nr	Description	Category	Priority Matrix			
			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
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

S1 Community Engagement	Y1		Y2		Y3		Y4		Y5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Appoint qualified Client Liaison Officer	←→											
Ward level NRE strategy representative forums	←→											
Development of forum constitution	←→											
Announcement of establishment of Ward forums	←→											
Execution of Ward forum activities (meetings etc)	←→											

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: <ul style="list-style-type: none"> • 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

Strategy nr	Description	Category	Priority Matrix			
			Impact	Quick Win	Funding Availability	Technical Capacity
T1	Eskom POS Metering assurance	Technical	L	L	S	O
T2	Technical & Non-technical losses separation	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

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

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 separation	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