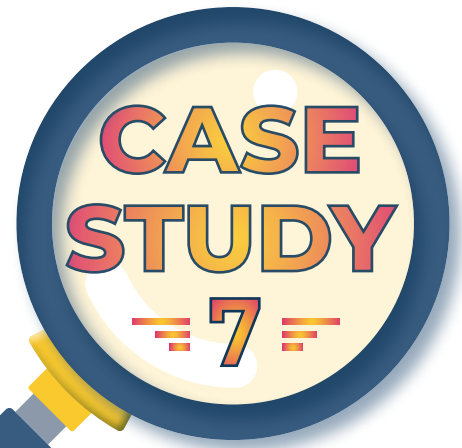




# Vuthela

ILEMBE LED PROGRAMME



**CASE  
STUDY**  
**7**

## **SYNERGY FOR ENERGY: Securing a reliable energy supply for the iLembe district**



**A Case Study in the iLembe District of  
KwaZulu-Natal, South Africa**

**August 2023**

 Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
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Swiss Confederation  
  
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Education and Research EAER  
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 **KWAZULU-NATAL PROVINCE**  
ECONOMIC DEVELOPMENT, TOURISM  
AND ENVIRONMENTAL AFFAIRS  
REPUBLIC OF SOUTH AFRICA

 ILEMBE DISTRICT MUNICIPALITY  
ILEMBE UMASIPALA WESIFUNDA

 **KWADUKUZA  
MUNICIPALITY**

 **MANDENI MUNICIPALITY**

 **enterprise ilembe**  
ECONOMIC DEVELOPMENT AGENCY

# Introduction

**Municipal, business, developmental and other stakeholders in the private and public sector are experiencing significant challenges due to the national electricity crisis and ongoing loadshedding.**

With the negative impacts of electricity disruptions permeating every sector of the economy in iLembe, and the growing demand for electricity to power future developments in the district, a reliable energy supply is essential for the district’s economic survival and growth.

In June 2023, the Vuthela iLembe LED Support Programme brought key stakeholders together to consider the initiatives already underway and what steps need be taken in the future to secure a reliable supply of electricity for the district.

The Vuthela Programme aims to improve the economic future of iLembe district residents through the sustainable economic growth of the local economy, including initiatives to create higher, better and more inclusive employment and income-generating opportunities.

The programme consists of five components:

- Public Finance Management (PFM)
- Municipal Infrastructure (MI)
- Private Sector Development (PSD)
- Building Inclusive Growth (BIG)
- Partnerships and Coordination (P&C)

The “Synergy for Energy” seminar allowed participants to share information and build a shared understanding of the challenges facing the district, along with the emerging opportunities to resolve them.





Discussions focused on the development of bulk infrastructure for supplying electricity in the coastal areas of the iLembe district; the innovative Supervisory Control and Data Acquisition (SCADA) system being implemented by the KwaDukuza Local Municipality; the impact of Non-Revenue Electricity (NRE) in KwaDukuza and Mandeni Local Municipalities; initiatives underway to address revenue losses in the local municipalities, and the production of renewable energy.

These issues have a direct bearing on securing energy for the district now and into the future. They will also be relevant to other municipalities who face similar challenges.

The body of information and insights generated at the seminar form the basis of this case study. Supplementary information has been provided from desktop research where relevant.

**The “Synergy for Energy” seminar allowed participants to share information and build a shared understanding of the challenges facing the district, along with the emerging opportunities to resolve them.**

This case study is intended to contribute towards the development of partnerships, plans and projects that will improve the reliability of the electricity in the coastal municipalities of the iLembe district and in other South African municipalities.

The content is presented in three parts which describe the prevailing situation, initiatives underway and issues to consider for the future.

# Part 1: The Current Situation

## Globally

Throughout the world, the lack of access to a reliable supply has become a major obstacle to conducting business and generating local revenue that in turn supports community and economic development.

A recent World Bank Enterprise Survey found that access to a reliable electricity supply was the fifth-biggest obstacle faced by firms globally.

The loss of economic activity and industrial production due to disruptions in power supplies have serious impacts on local and national economic success and equitable and inclusive social development. This means that securing a consistent, reliable supply is central to all economic development and social advancement initiatives.

Producers are required to generate sufficient electricity to meet the daily national need every day of the year and distributors of electricity are expected to provide a continuous supply through their network from the producer to consumers.

However, these basic requirements cannot always be met due to electricity generation, transmission and distribution failures, including the breakdown of generating and transmission equipment, failures at power stations and substations on the network, or faults in the cabling or network infrastructure.

The World Bank uses globally recognised indices

to calculate and benchmark the reliability of national electricity supply networks. These indices provide customers with information about the quality of the power supply, and can be used to guide investment and planning decisions.

The IEEE 1366 index defines Key Performance Indicators for measuring the performance of the distribution sector:

- SAIFI or ASIFI: number of supply interruptions an average customer experienced in a year.
- SAIDI or ASIDI: total interruption time an average customer experienced in a year.

## Nationally

In South Africa, NRS 048-6 is the standard adopted by the National Energy Regulator of South Africa (NERSA). This standard is used to measure network performance and provides indices of reliability and availability of the electricity supply:

- Availability of supply – the average duration of an interruption of supply experienced by the customer.
- Reliability of supply – how frequently on average an interruption of supply is experienced by the customer.
- Restoration of supply – the percentage of customers that had their supply restored within a

specified target time after an interruption.

d) Worst served customers – the percentage of individual customers that receive poor network interruption performance levels.

e) MV transformer unavailability – the average duration of interruption of supply that affects the MV/LV transformers only.

f) Network reliability – the frequency of interruptions that occur on a network normalised to 100km.

NERSA recognises that distribution licensees do not comply with the minimum requirements specified in this part of NRS 048 at present, and the implementation of this part of NRS 048 will require human, technical and financial resources.

## Locally

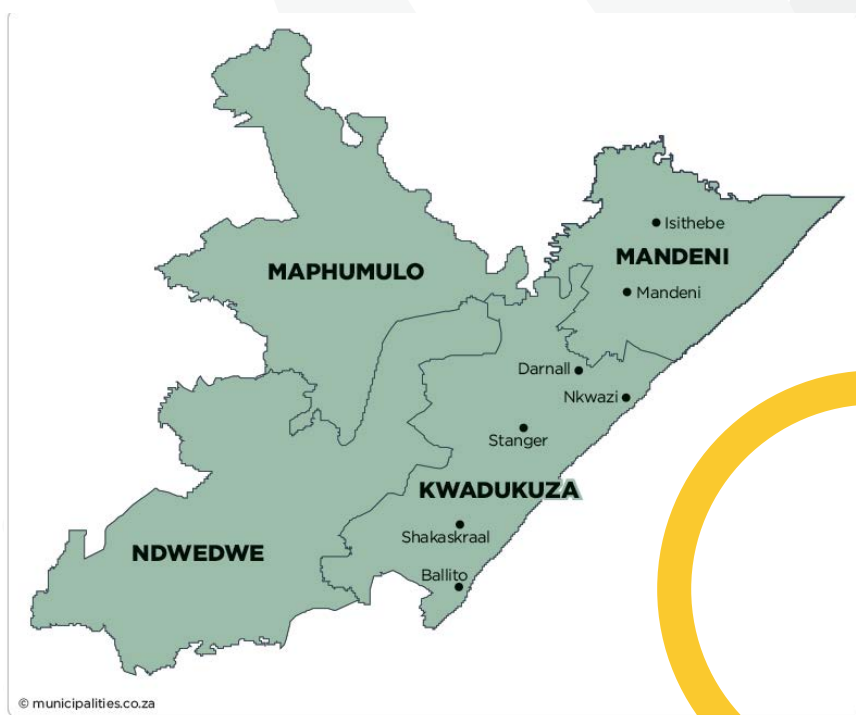
The KwaDukuza Municipality supplies all wards except ward 1, ward 25, part of ward 21, part of ward 27 and part of ward 3, which are supplied by Eskom.

The municipality has three 33kV intake points from Eskom and three additional intake points at 132kV are being planned for the future.

The notified maximum demand is 152MVA.

The supply network consists of 75km of 33kV distribution lines, 464km of 11kV reticulation lines and 944km of low voltage lines. It has 14 distribution substations (33kV and 11kV) and seven additional substations are planned for the future.

The Mandeni Local Municipality has a license to distribute electricity within parts of ward 3 which includes the town of Mandeni.



### iLembe District Municipality



The remaining 17 wards are supplied by Eskom. The internal electricity network of Mandeni town is arranged in a ring feed arrangement.

Part of the town is supplied at 11kV, and part at 6.6kV with two step-down transformers. The 33kV network is an underground network that supplies two 10MVA transformers, at 7MVA Notified Maximum Demand (NMD) and supplies power to the Umgeni Water’s Lower Tugela Bulk Water Treatment Works.

The 11kV network is a combination of Overhead Line (OHL) and underground network and is stepped down to 6.6kV. Mandeni Local Municipality supplies electricity to 1 300 households and 260 streetlights.

**Reliability of Infrastructure**

Mandeni Municipality’s 11kV network has 8km OHL and a 3.6km underground network.

The condition of the OHL network is good, but the section breaker is faulty and it has been bypassed. The underground network also is good

and unplanned outages are limited.

The 11kV is stepped down to a 6.6kV underground network which is in poor condition, resulting in many unplanned outages due to the ageing infrastructure.

The 33kV underground network is 8km long and the condition is very good. All 260 streetlights are operational and are fixed promptly when faulty. The Mandeni Local Municipality has benefited from an initiative sponsored by the Swiss Economic Cooperation and Development (SECO) unit, implemented through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. Conventionally powered streetlights were converted to solar-powered streetlights, including some of the larger high mast lights such as at the sports grounds. The project resulted not only in energy savings to the municipality but also assisting in community safety and improvement of the business environment allowing longer business operating hours.

## Challenges

Annually about R2.5m is budgeted by the Mandeni Local Municipality for maintenance of the electricity infrastructure. After repairing faults due to unplanned outages, the municipality has to wait for about two hours for an Eskom technician to restore power.

The staff complement is inadequate to carry out all tasks and the municipality has a panel of contractors to assist with breakdowns.

Supply Chain Management processes take too long, which leads to non-expenditure on maintenance. This contributes to unplanned outages. Technical losses amount to about 8%.

In areas where Eskom supplies electricity directly, the response time by Eskom in the case of unplanned outages is longer than anticipated.

**F** *There are significant delays at almost all stages of project implementation on projects involving Eskom.*

There are significant delays at almost all stages of project implementation on projects involving Eskom.

Some Eskom service charges are not financially justifiable, including charges related to administration, transmission network capacity, distribution network capacity, ancillary services, electrification and rural subscriptions.

Charges which cannot be avoided include those related to demand, services, network demand and standard energy charges. 🔥



## Part 2: Projects In Progress

### Moving the dial

**Several initiatives are underway to improve the efficiency and reliability of the electricity supply in the coastal municipalities of the iLembe district.**

The shortage of electricity on the Eskom grid is restricting the performance of local business and industry. It is also regarded as a major obstacle to sustaining economic activity and improving growth prospects in the future.

Partnerships between the private and public sectors will need to be fostered and strengthened significantly to secure a reliable power supply in the district, including the rapid development of local renewable energy solutions to supplement the national Eskom grid.

### In the district:

- The KwaDukuza Local Municipality is installing a Supervisory Control and Data Acquisition System (SCADA) to manage the flow of power through substations in the network by remote monitoring and ability to manage switching from a central Control Room. This will help to create efficiencies in the network and manage the impact of faults and loadshedding when it is commissioned towards the end of this year. (See more detail on SCADA in content that follows.)
- Sections of the overhead electricity supply network in KwaDukuza urban areas and ageing

underground cables at Mandeni town are being upgraded to remove bottlenecks and provide additional transmission and distribution capacity.

- Energy losses at Mandeni due to billing errors, inaccurate reading, unmetered customers, meter tampering and illegal connections were reduced by 15% last year, compared to the previous year.
- The Vuthela Programme supported the development of strategies to address NRE (electricity losses) in KwaDukuza and Mandeni to reduce NRE and improve revenue collection. This includes implementing web-based automatic meter reading, auditing electricity resellers, conducting weekly service connection raids and monthly inspections of meters.
- A policy on energy has been adopted by the KwaDukuza Local Municipality. The Energy Policy has been approved and by laws are to be amended through a process of consultation. The policy will open the way for the private and public sector to collaborate and to install and operate renewable energy facilities.

### At national level:

- Over 100 municipalities are partnering with the Embedded Generation Support Programme to implement small-scale energy generation (SSEG) facilities. The programme provides municipalities, residents, business owners and other stakeholders with guidance about municipal regulations, tariffs and application processes relating to small-scale energy generation.





About 40 municipalities have already devised feed-in tariffs, enabling them to implement SSEG initiatives.

- Funds are still available from National Treasury for municipalities to access in alleviating the power generation shortage and assist in electricity supply and demand management. Of the R10 billion available in the Budget Facility for Infrastructure (BFI) Fund, only R3 billion has been spent. The fund is implemented by the Development Bank of Southern Africa (DBSA) to support the implementation of national priority projects.

The facility will consider submissions from national departments in respect of infrastructure proposals that are:

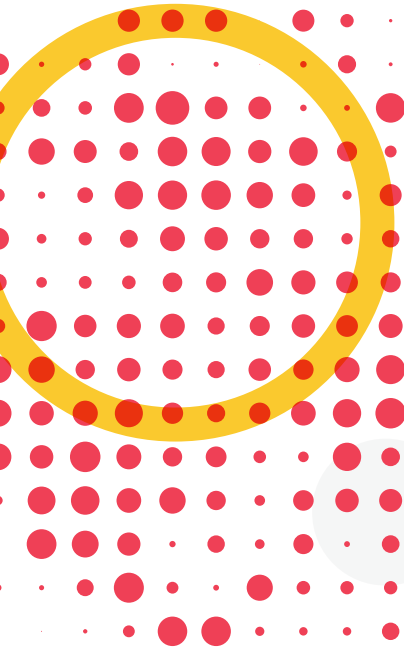
1. Clearly identified as a national priority by the Presidential Infrastructure Coordinating Commission.

2. Very large and strategic interventions (a minimum total project cost of R1 billion for projects and R3 billion for programmes).

These are interventions that imply a significant commitment of fiscal resources and which will have substantial long-term impacts. This is the overarching criteria that a submission must meet to be considered under the facility.

Smaller capital projects, programmes or departmental asset acquisitions will not be considered by the facility, and should form part of the department's main budget submission in terms of the main Medium-Term Expenditure Framework guidelines, available at <http://www.treasury.gov.za/publications/guidelines>.

Further guidance on planning and budgeting for capital spending is provided in National Treasury's Capital Planning Guidelines, available on the same page.



*The Sundumbili Water Treatment Works*

**World Bank support:**

- The World Bank is providing technical assistance and expert advice to several metropolitan municipalities in South Africa aiming to improve the reliability of their local electricity supply.
- World Bank advisors confirm that renewable energy infrastructure is appropriate for KwaDukuza’s energy mix augmentation and is expected to yield enormous social and economic benefits. The World Bank is also providing technical and advisory services to the KwaDukuza Local Municipality and has provided advisory services to the Mandeni Local Municipality on the energy-related Vuthela projects.
- The World Bank has provided supporting advisory services for a feasibility study

conducted by the Vuthela Programme to augment the Eskom electricity supplied to the Sundumbili Water Treatment Works with solar power to reduce electricity costs and improve reliability of water supply during loadshedding.

It also assisted by developing a pre-feasibility study to introduce solar power at the Isithebe Industrial Estate, which already has preliminary indications of it being a feasible option to augment electricity supplied to the Estate.

The initiatives underway at local, national and international level could support and enhance collaboration between the private and public sector on future strategies to improve the reliability of the electricity supply in KwaDukuza.



## At KwaDukuza Local Municipality

Energy losses in the KwaDukuza Local Municipality are averaged at 11GWh, amounting to losses of R20m a month on average.

Technical losses average is 10% of 11GWh – 1.1GWh, or R2 million per month.

(These are defined as network or grid losses related network design. These are losses due to flow of current through conductors)

Non-technical losses average is 39.6GWh, resulting in a loss of R18m a month.

(These are known as commercial losses: any consumed energy but not invoiced for due to theft, fraud or malicious and illegal connections to the grid, installation errors, meter deficiency or tampering, lack or delay of payment by consumers, and errors in accounting, billing, and record-keeping).

The Auditor-General’s reports to the KwaZulu-Natal provincial legislature for the KwaDukuza Local Municipality over the past three years includes a short section titled “Material losses – electricity”. Revenue for about one fifth of all the electricity supplied by the municipality is lost.

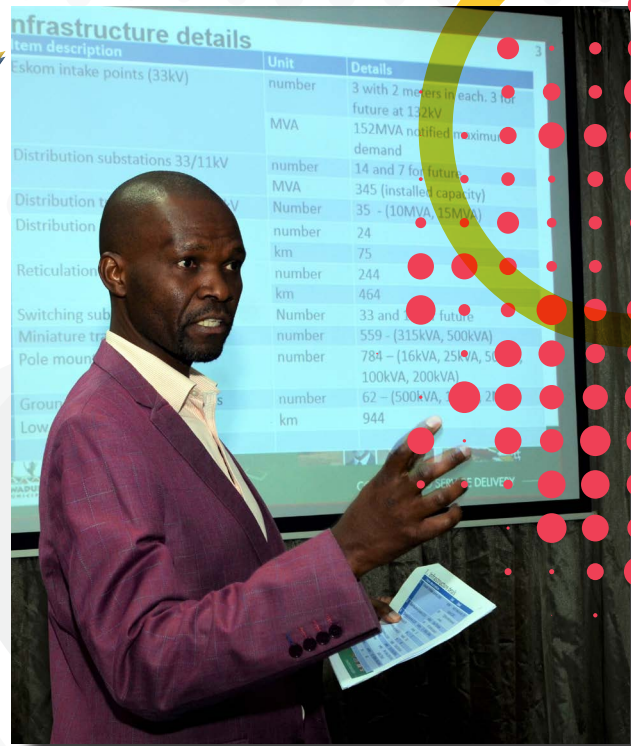
Here are the relevant sections from the Auditor-General’s report for KwaDukuza Municipality under “Material losses – electricity”:

### 2018 - 2019

“... material electricity losses of R115,1 million were incurred, which represents 18,05% of the total electricity purchased. Technical losses were due to transmission and distribution losses while non-technical losses were mainly due to illegal connections...”

### 2019 - 2020

“... material electricity losses of 137 297 168 kWh



Mr Sibusiso Jali, Executive Director Electrical Engineering Business Unit at KwaDukuza Local Municipality sharing at the Synergy for Energy seminar

amounting to R152,56 million were incurred, which represents 20,94% of total electricity purchased. The losses were due to transmission and distribution losses and illegal connections...”

### 2020 - 2021

“... electricity losses of 153 728 734 kwh amounting to R181,21 million were incurred, which represents 22,82% of total electricity purchased. The losses were due to transmission or distribution losses and illegal connections...”

### Non-Revenue Electricity

From the Vuthela Programme project on NRE, conducted for the KwaDukuza and Mandeni Local Municipalities various causes of NRE were identified. But so too, were strategies identified to assist in addressing NRE. These

strategies were grouped into Technical, Financial, Institutional and Social interventions and further classified into level of impact, if it may be a quick win, funding sourced and capacity by the municipalities to implement.

### Causes of NRE

- No check meters on KwaDukuza Local Municipality side
- No statistical meters
- Old infrastructure
- No annual energy losses simulation done to check effectiveness of network upgrades
- Unread meters
- Faulty meters
- Bypassed meters
- Fuses removed
- Unmetered connections
- Ghost vending
- Illegal connections
- Unbilled accounts
- Underestimates
- Culture of non-payment for services

### Strategies to curb NRE

- Metering assurance at the Eskom point of supply
- Ensure all large power users are on automatic meter reading
- Separation of technical and non-technical losses
- Implementation of SCADA system and Control Room
- Electrification and prepaid metering in informal settlements
- Customer audits to verify consumption
- Bulk metering of stands with multiple prepaid meters
- Customer metering for small power users
- Review of credit control processes

- Tariff study and review
- Implementation of customer management system
- Implementation of single platform to manage indigent consumers.
- Implementation of data warehousing and business intelligence platforms.
- Establishment of revenue protection unit
- Community engagement

These actions support the energy losses reduction strategies developed:

- Electricity resellers meter audits, AMR implementation and service level agreements reviews
- Weekly service connections raids
- Monthly inspections, repairs, replacements and back-billing for faulty meters

Projections on 10% reduction in energy losses over five years would result in additional total revenue of R334 m over the five years.

### Vuthela transfer projects

The KwaDukuza Local Municipality developed a mini-NRE programme, including some of the NRE strategies identified through the Vuthela Programme, that will be implemented through a grant transfer project.

The KwaDukuza Local Municipality, also a licensed electricity provider, has a large and diversified customer base. As with many municipalities, electricity, second to property rates, forms the largest component of the municipality's revenue. In turn, revenue has to be protected but also applied, to ensure continued operation, management and maintenance of electricity infrastructure and services. The KwaDukuza Local Municipality has identified several strategic activities in alignment with the NRE Strategies developed through the Vuthela Programme, to assist in revenue protection and strengthening service delivery and

communications with stakeholders on electricity matters.

The activities will be implemented under a mini-programme to address NRE and include the following:

- Identify and audit all formal electricity resellers (estate, commercial business park, shopping centres).
- Identify and audit selected informal electricity resellers within selected wards (residential rental units and cottages).
- Repair, replace formal and selected informal electricity resellers' metering equipment or meters in the case of Small Power Users (SPU) or Metering Equipment in the case of Large Power Users (LPU).
- Implement Automated Meter Reading (AMR)/Smart Metering on formal and selected informal electricity resellers.
- Develop and facilitate signing of Service

Level Agreements with all formal electricity resellers and ancillary legal documents and notices.

- Develop and implement Electricity Meter Management System.
- Community engagement.
- Training of superintendents and artisans on aspects such as meter auditing, metering infrastructure installation, replacement and repairs, use of the Meter Management System developed, Interdepartmental Standard Operating Procedures and ethics and conduct.

### SCADA and Control Room

The KwaDukuza Local Municipality is in the process of installing a SCADA system and Control Room to monitor and manage the energy supply in real time and remotely through the Control Room's connection to each substation fitted with the local SCADA for outages and load conditions.



**Factory Acceptance Testing of Human Machine Interface panels, March 2023. In the centre, Mr Duma Mhaule, Director: Electrical Engineering Services, and the KDM Project Manager, Mr Brendan Pillay on left, with staff from Control SI, illustrating the built components.**

Information from the Control Room can also be shared with the electricity customer service operators to respond to customer queries on the electricity network’s operations.

The SCADA and Control Room therefore enable the entire electricity supply network to be remotely monitored and controlled from a central control room, providing greater predictability about the network’s performance and allowing the municipality and consumers to manage the disruption to their schedules due to loadshedding. It will also allow an improved, rapid response to electricity outages, with the likely cause of outages immediately visible on the SCADA system and the potential – where appropriate – to control components at a substation at fault or as necessary.

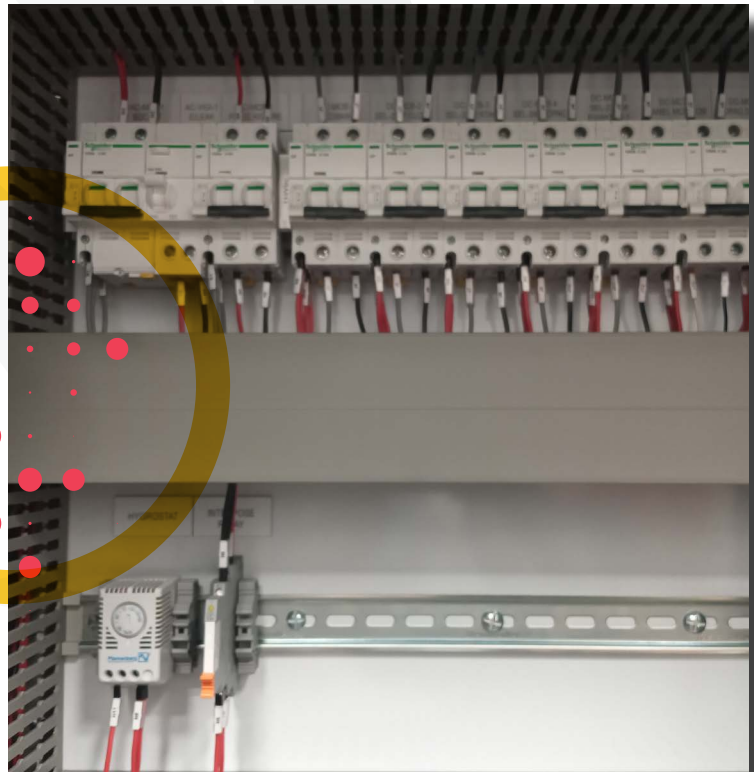
The full SCADA system and Control Room are expected to go live in November 2023, but full testing and commissioning is expected to be

completed by December 2023.

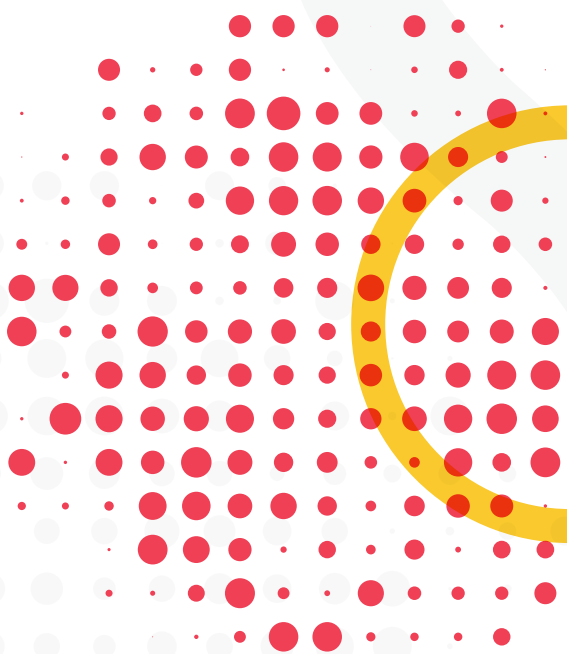
The initial functional design specifications for the R24-million SCADA system were developed under the Vuthela Programme. This assisted the KwaDukuza Local Municipality to successfully apply for funding under the European Union’s Fifth Call for Proposals for the General Budget Support Programme, facilitated through National Treasury.

This project is a lasting legacy of the Vuthela Programme. It demonstrates how innovation and technology can be applied in a developmental manner to improve the delivery of essential services and contribute to economic growth.

The Vuthela Programme began planning on this project in 2019, and the support of many people in the municipality, partner Swiss State Secretariat for Economic Affairs (SECO), technical partners and service providers was



*Part of the hardware of the SCADA system*



required throughout the project.

The World Bank is providing technical and advisory support from inception through to implementation and it is hoped that the World Bank will continue to play an advisory and training role to ensure the successful operation of the SCADA system. This includes advising on the operational procedures suited to the KwaDukuza Local Municipality’s business and infrastructure environment, continuation of training and capacity building, establishing Standard Operating Procedures and ensuring SCADA communication protocols are optimal for the municipal system.

The system uses digital signals to relay critical information about the status and performance of the electrical system to a control room in real time, providing an accurate measure of the maximum demand and the load profile on the network. It is envisaged that the communication platform will make use of the GSM network.

Technicians have received initial training to operate the system and additional operators will be appointed and trained in the new municipal financial year (2023/2024).

Once it is operational, the SCADA system and Control Room will significantly enhance the capacity of the KwaDukuza Local Municipality to provide efficient electrical services to its residential and business consumers.

It will provide real-time monitoring and control of the electrical network, enabling operators to optimise the power available through measuring the demand and improving efficiency.

The SCADA system will also reduce response times to customer queries and technical faults through quicker fault finding, power restoration and preventative maintenance.

The system will improve metering and revenue collection and enable constant trend analysis of

the network’s performance. It is also foreseen that the system will assist the municipality to provide the statistical information to report on the internationally used formula of the IEEE 1366 indices SAIFI or ASIFI and AIDI or ASIDI as explained earlier. This will further assist the municipality to establish a baseline from which to improve electricity service delivery.

The completion of Phase 1 of the project means that monitoring and communication equipment has now been installed at all major distribution substations in the supply network and is in the process of being connected to the planned central Control Room in KwaDukuza.

Phase 2 will include installing equipment at the 36 key switching substations.

Phase 3 will include a smart metering system that will measure the power flowing through all the feeder lines and the 1 405 reticulation transformers in the network.

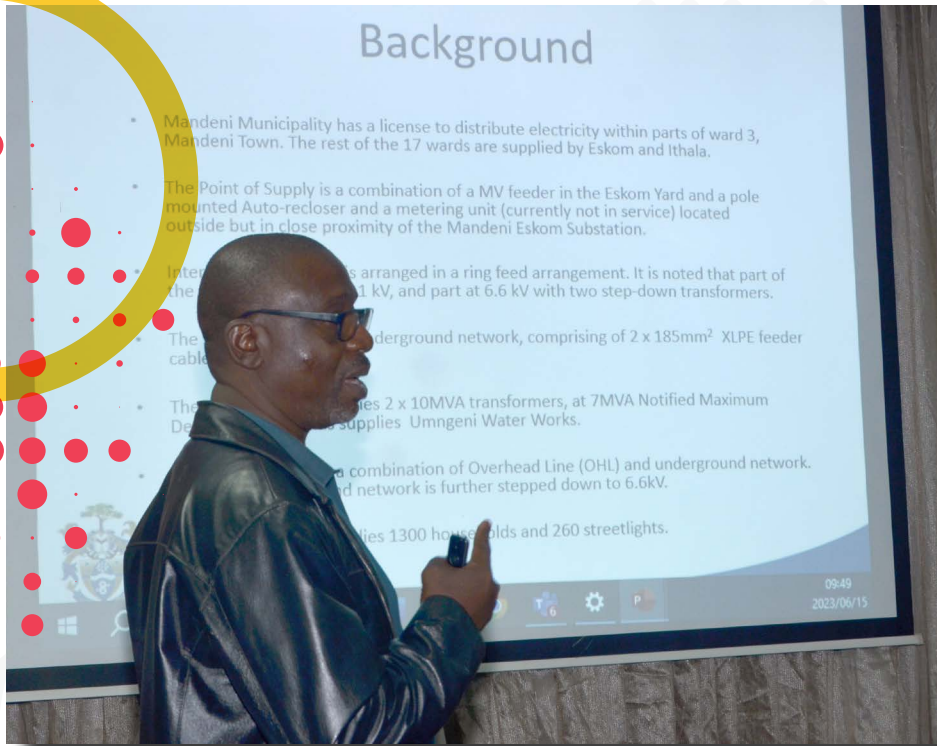
The enormous benefits of bringing predictability to a situation which has become increasingly uncertain and disruptive will help communities, businesses and the municipality cope better as loadshedding continues.

## At Mandeni

### Master plans for infrastructure development

Currently the municipality receives 3.5MVA NMD from Eskom and the peak maximum demand drawn is 2.8MVA.

The municipality plans to upgrade the 6.6kV network to 11kV network and to phase out old oil insulated ring main units with vacuum insulated units. Funding of this large capital expense remains a challenge for this municipality with a very small customer and revenue base.



*Selby Msweli, Electrical Superintendent at Mandeni Local Municipality sharing at the Synergy for Energy seminar*

A 132/33/11kV substation is to be built, together with tie-in lines.

A Driving Licence Testing Centre is under construction and will demand 200kVA.

A rehabilitation centre is proposed to be constructed by early next year which will demand 300kVA.

**NRE**

The Revenue Protection concept has been developed over the past 20 years and has now reached a new level of expertise.

**Causes of NRE**

- Billing errors and inaccurate meter reading
- Unmetered customers
- Meter tampering and illegal connections
- Cable theft

**Financial impact**

Losses over the past three years:

R1 086 874.64 (2021/2022)

R1 366 032.23 (2020/2021)

R1 557 040.68 (2019/2020)

**Other impacts**

- Disruption of distribution network
- Extended breakdowns
- Community unrest

**Challenges**

- Financial constraints
- Non-availability of human capital
- Lack of technological innovations
- Fraud and corruption



## Strategies to curb NRE

- Reinstate existing vandalised check meter installations
- Download metering data on a monthly basis and compare with Eskom billing data
- Monthly analysis of Eskom billing for anomalies
- Data cleansing
- Meter audit
- Conduct a cost of supply study

## Successful NRE strategies

- House-to-house meter audits: each meter visit audits the meter for correct functioning, electrical safety and possible illegal interference or tampering.
- Municipality asset hardware audit is being performed on each meter with address and GPS co-ordinates.
- Cost per update is easily justified by added revenue enhancement benefits – audits, safety verification, old tokens used and asset audit.
- Non-functional meters replaced, which enhances revenue.
- Reduction in non-technical losses.

## Lessons learnt

- The audit provided a complete electricity consumption and energy efficiency assessment.
- Non-technical losses were reduced by 15-30%.
- Illegal usage of electricity was discovered and effectively dealt with.
- The customer and meter database information was updated.
- Old defective meters were detected and replaced with new ones, which increased the revenue base.

## Vuthela transfer project

NRE projects that will be implemented by the Mandeni Local Municipality were developed as an outflow from the NRE Strategies that were prepared for each municipality through the Vuthela Programme.

The Mandeni Local Municipality, as with every licensed electricity provider, prepares the so-called NERSA D-Forms annually for submission to NERSA for the review of information on electricity supply and for tariff approval by NERSA as issued by the municipality. Through the Vuthela Programme and the NRE Strategies project, the need was identified to improve the accuracy and completeness of the NERSA D-Form information of the municipality.

In addition and in alignment with instructions issued by NERSA, the municipality will perform a Cost of Supply study, to establish whether its electricity tariffs are just and sustainable in accordance with its infrastructure and consumer profile. The NRE project will address these two items and assist the Mandeni Local Municipality to better understand its cost to provide electricity, to improve service delivery and aim for sustainable electricity services.

**The NRE project will... assist the Mandeni Local Municipality to better understand its cost to provide electricity, to improve service delivery and aim for sustainable electricity services.**

## World Bank support to metropolitan municipalities in SA

The World Bank provides advisory services related to improving the process of getting electricity and securing the reliability of supply, facilitated through National Treasury.

This includes:

- Technical assistance in the preparation of Performance Improvement Plans.
- Specialised technical support from experts.
- Support during implementation stages of the project.

Assessment of the utility sector focused on commercial and distribution operations by considering the three roles played by the utility company:

- Energy seller
- Network developer

- Network maintainer and operator

World bank support to KwaDukuza Local Municipality:

- SCADA technical support.
- Development of NRE management strategies.
- Support with ad-hoc requests for energy advisory services, including pre-feasibility report for installing PV projects at industrial facilities and water treatment works.
- Estimation of the technical losses.
- Assessment for implementing a full scope contact centre.

**The World Bank provides advisory services related to improving the process of getting electricity and securing the reliability of supply...**

## Part 3: Powering the Future

**South Africa has a well-established and mature banking and finance sector willing to support the public and private sector. The private sector has the expertise with major international energy companies having presence in South Africa, bringing technical and commercial expertise required to build the economy.**

The private sector has a pipeline of projects available to support the challenges of reliable and sufficient electricity to consumers, industries and business, with a focus on generation and transmission opportunities.

The KwaDukuza Local Municipality established an Energy Office to draft a policy around renewable energy sources like solar power.

The policy has been adopted and addresses issues around safety and compliance, installation regulations, and the technicalities of feeding solar power back into the national Eskom grid. It will determine how the municipality plans to create an enabling environment for increased renewable energy in the KwaDukuza Local Municipality and how it will address any revenue losses incurred.

The policy will determine tariffs related to renewable energy projects and co-ordinate project proposals received from the private sector for independent power producers and small-scale embedded generation.

“Embedded Generators” are defined as entities that operate one or more generation units that are connected to the national electricity distribution system.

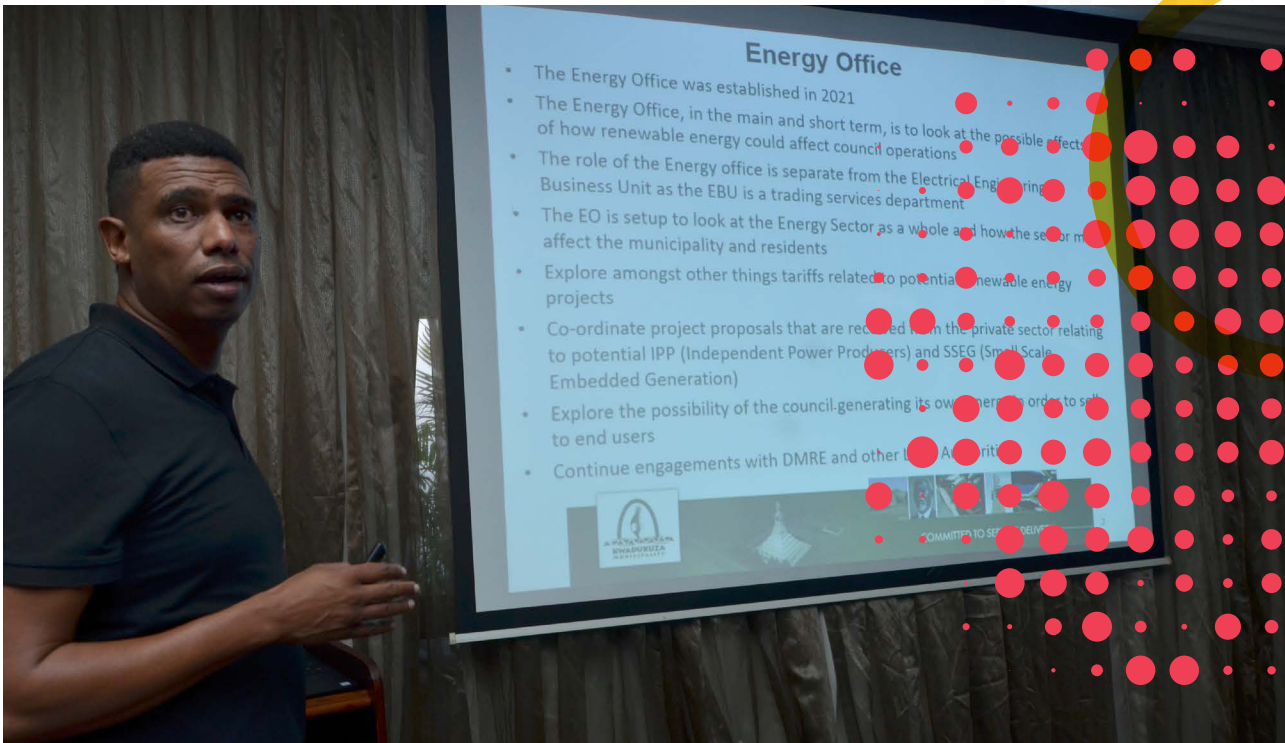
“Small-Scale Embedded Generator” refers to a unit that produces less than 1MW.

“Medium-Scale Embedded Generation” is defined as an embedded generator with a capacity above 1MW but below 10000kVA (10MW).

The role of municipalities in the energy value chain has changed. Municipalities now have to execute the following main functions: as energy consumers, producers and distributors, investors in the energy sector, and motivators for energy efficiencies. These are enabling factors to support economic and social development.

A team of policy drafters working behind the scenes had to answer several questions to ensure the policy supported these functions:

- How does the municipality plan to create an enabling environment for increased renewable energy in the KwaDukuza Local Municipality?
- How will it address any revenue losses incurred?
- How will the policy address the district’s diverse customer base, safety and certification, compliance, incentives and security?
- What will be the key benefits of the policy once it is implemented?
- What support or collaboration will be required from other stakeholders to finalise and implement the policy?
- How will the policy assist businesses and residents to protect themselves against loadshedding?



*Chimene Pereira, Director Special Projects from the KwaDukuza Local Municipality's Energy Office, sharing at the Synergy for Energy seminar*

The drafting process had to be based on constitutional and regulatory requirements. Electricity generation licenses are issued by the NERSA.

In January 2023 the Minister of Mineral Resources and Energy amended legislation that controls the generation of electricity. Facilities that provide standby or back-up energy during power outages and facilities that are not connected to the national grid are exempted from the requirement to apply for a licence and be registered with NERSA.

The exemption also applies to generation facilities that supply electricity to one or more customers and those with a capacity of less than 100KW.

The policy is being devised with a raft of business models in mind:

Building generation capacity: rooftop solar

Photo-Voltaic systems on municipal buildings and stand-alone power plants like wind and solar farms can be financed through the municipality, debt or grants. Public-Private Partnerships and special purpose vehicles can be formed between municipalities and partners.

Procuring energy: electricity produced by embedded generators like rooftop residential systems and Independent Power Producers can be purchased through feed-in tariffs, net metering and net billing or power purchase agreements.

Facilitation: municipalities can play a trading and facilitation role by buying electricity from local producers and selling it to consumers, operating a storage facility to store power in low use periods and installing and maintaining network systems through tariffs and service fees.



## Conclusion

**Several new approaches to securing a reliable electricity supply in the iLembe district are being considered by the public and private sector.**

The lack of sufficient collaboration between municipal officials and businesses operating in the energy sector is hampering the implementation of effective responses to the national electricity crisis.

There is an urgent need to strengthen interaction, collaboration and partnerships between the private and public sector. This can only be achieved through an active, formal process to stimulate and facilitate such collaborations.

Most smaller municipalities do not currently have the technical expertise and resources to install renewable energy solutions on their own. Private enterprise has the skills and the resources,

but they perceive that their efforts are often hampered by the absence of clear and enabling policy and regulations which are conducive to developing renewable energy options.

Collaboration can be achieved though creating effective platforms for engagement and holding regular workshops. Private sector skills and resources exist and create an excellent opportunity for collaboration and strengthening between the private and public sectors in building our economy and providing reliable electricity services.

Collaboration with NERSA, Eskom, Department of Mineral Resources, independent power producers, the local municipalities and the private sector is required for successful implementation of projects that will secure a reliable supply of electricity in the iLembe district in the future.

