

Leveraging the benefits of Smart Metering technology in Clarens, Free State

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- Background
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- Problem Statement
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Background of Clarens, Free State

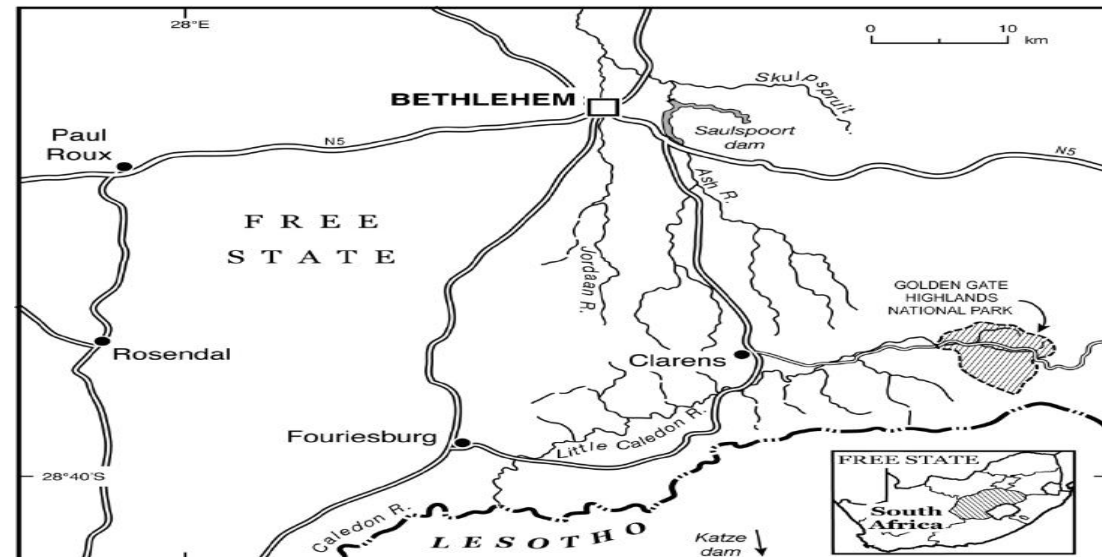


Background of Clarens, Free State

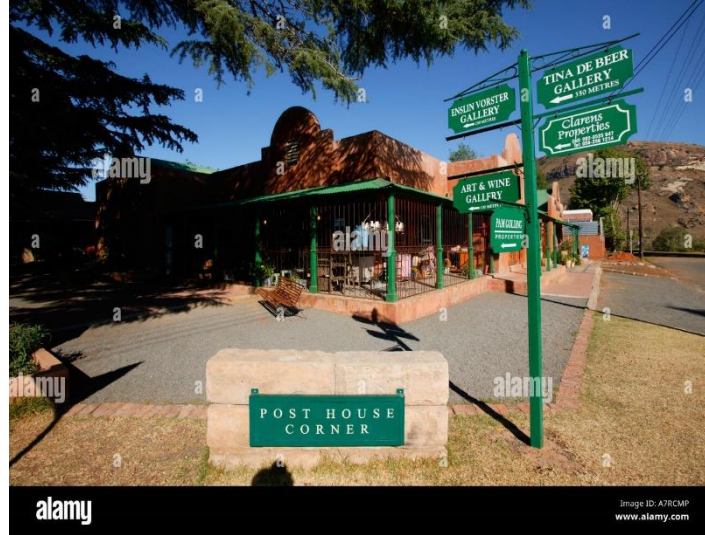
The little town of Clarens is situated on the picturesque Eastern Free State between the towering Rooiberge and the Maluti Mountains. It is established in 1912 named after the Clarens in Switzerland.

Clarens is just 15 minutes away from the Golden Gate National Park, 3 hours from Johannesburg and Bloemfontein and 4 hours from Durban, making it the perfect destination for a weekend or mid-week trip with family.

It bids home to numerous well-known artists with an array of art galleries scattered around the town square. The tranquil village-like ambience with a wide variety of restaurants and boutique shops creates a feeling of 1900's European nostalgia. It offers a wide range of outdoor and sporting activities: from a brisk 9 holes at the scenic Clarens Golf Club to some of the finest trout and fly-fishing waters in the country. Other activities include river rafting, abseiling, hiking, horseback riding, mountain biking amongst some.



Background of Clarens, Free State



Site Layout and Technical Information





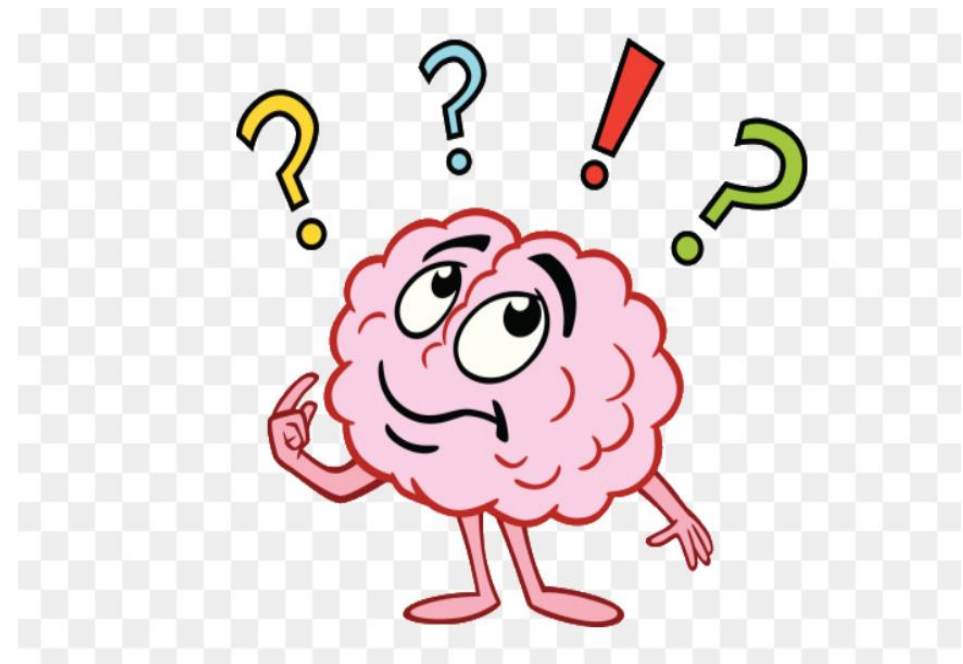
- Small town – 13.5 km²
- Home to numerous Arts and Crafts Exhibition Events
- Most notable: Clarens Craft Beer Fest
- Tourist attraction, holiday destination
- Guesthouses, lodges and holiday homes
- Various restaurants and eateries
- Outdoor activities

Technical Information	
Substation	Clarens Rural
Feeder	Bokamoso
Rating	4.68 MVA
Voltage	22kV
Transformers / Mini-sub (22kV/400V)	40
Large Power Users (LPU)	7
Small Power Users (SPU)	487
Pre-paid Users (PPU)	1175

Problem Statement



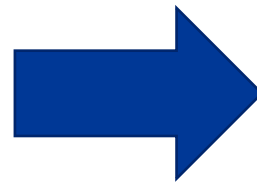
- Estimation of 487 SPU's
 - Non-paying customers – Lack of trust and frustration from customers
 - Cost of Meter Readers
 - No visibility of meters
- TID Rollover
 - Converting meters from KRN1 – KRN2
- No visibility of 1175 PPU's
 - Common Base Meter / “Dumb Meters”
 - Declining sales volumes
 - Increasing Zero/Low customers
 - No line-of-sight on tampered and by-passed meters
 - Customers buying from ghost vendors
- High NTL on the feeder



Proposed Solution



Digitize Metering Infrastructure



Implementation Plan



- Perform site assessment – understanding the LV network
- Clarens Town
 - Underground cable network with mini-sub
 - 81% of customers are SPU (1-phase and 3-phase)
 - 18% of customers are PPU (1-phase)
 - 1% of customers are LPU (3-phase)
- Clarens Township – Kgubetswana
 - Overhead line network – LV Transformers
 - 99.9% of customers are PPU (1-phase)
 - 0.1% of customers are SPU (1-phase)

Deploying Smart Metering Technology - Challenges

- No access / Unavailable customers
- Frustrated / Hostile customers
- Vending issues – Data Related
- SSEG's issues
- Customer Education
- Material Management
- Updating of data on systems



- Project started March 2023

	Customer Base	Smart Meters Installed	Meters Converted
SPU	487	395	81%
PPU	1175	1082	92%

Transformers / Mini-sub	Data Concentrators Installed
33	31

** 2 x Mini-sub*s are not in use.

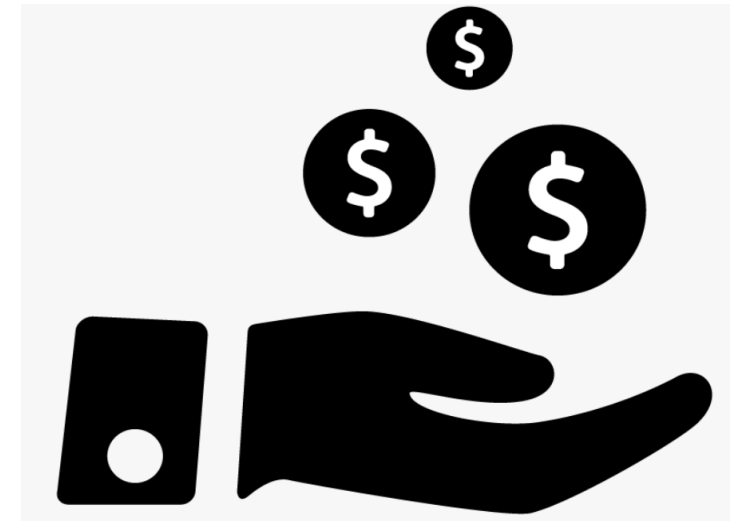
Benefits Realised



- Smart Meters were pre-configured on KRN2.
 - 100% conversion rate for the area.
- All vendors in the area were uploaded to vend on KRN2.
- A dedicated on-site mobile station to assist with customer queries.
- Data and SGC discrepancies were corrected during the project.



- Estimations of SPU's reduced by 81%.
- Guarantee accuracy of customer bills.
- Customer bills are provided timeously.
- Contributes to improvement in sales and reduction of NTL.
- No meter-reading costs.



- On 18 July 2024 overdue debt stood just under R 600 000 for the SPU.
- Pilot – Remote disconnection / re-connection functionality of Smart Meters.
- Defaulting customers were notified by SMS of their imminent disconnection.
- Customer Services and Finance departments setup Mobile Station in Clarens.



- Flag customers to be disconnected on Fault Management and Billing Systems.
- To prevent customers from logging No Supply faults.
- On 18 - 19 July 2024 remote disconnections were done from the HES. Field staff were on-site to verify these disconnections.

Eskom Notice: Good day, kindly note that the Eskom pop up office will be on the Clarens Square from 09:00 on the 18th and 19th July. Customer Service and Finance will be present to assist with your account queries.

Just been to Eskom on the square. They are helpful but have said that anyone who doesn't come to resolve their disconnection problems today will only be assisted with possible reconnection again on Monday and will therefore have no electricity the entire weekend.

09:23



Accolades for the Eskom guys on the square today! They were so very helpful 🙌🙌🙌

Does anybody know why only certain areas are without power?
Is Eskom working on the problem?



- A customer making an EFT at our mobile station.
- 37 x SPU's were disconnected – overdue debt amounting to **R568 199.45**
- 28 x SPU's paid immediately after being disconnected – totalling **R474 149.39**.
- These 28 x SPU's were re-connected remotely within 4 hours upon receipt of payment.
- 9 x SPU's did not process any payment – remain disconnected. Total debt **R156 048.51**
- 83% of the overdue debt recovered in less than 48 hours – great success!!!



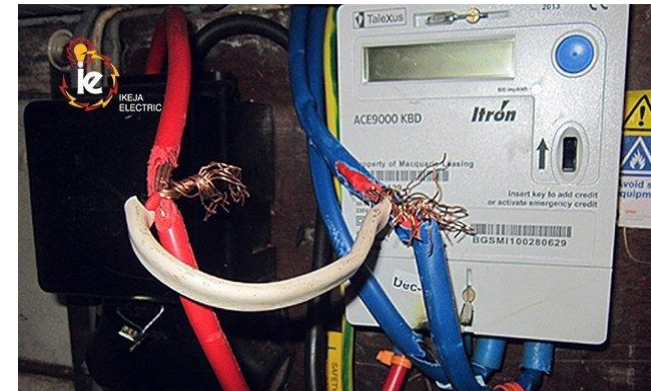
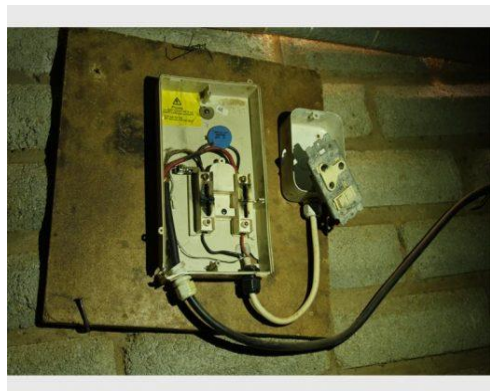
	Rate (Urban)	28 x Re-connections
Working Hours	R 1 140*	R 31 920
After Hours	R 1 500*	R 42 000
Remote Disconnection	R 570*	R 15 960

*Rates are as per Schedule of Standard Fees 2024/25 of Eskom

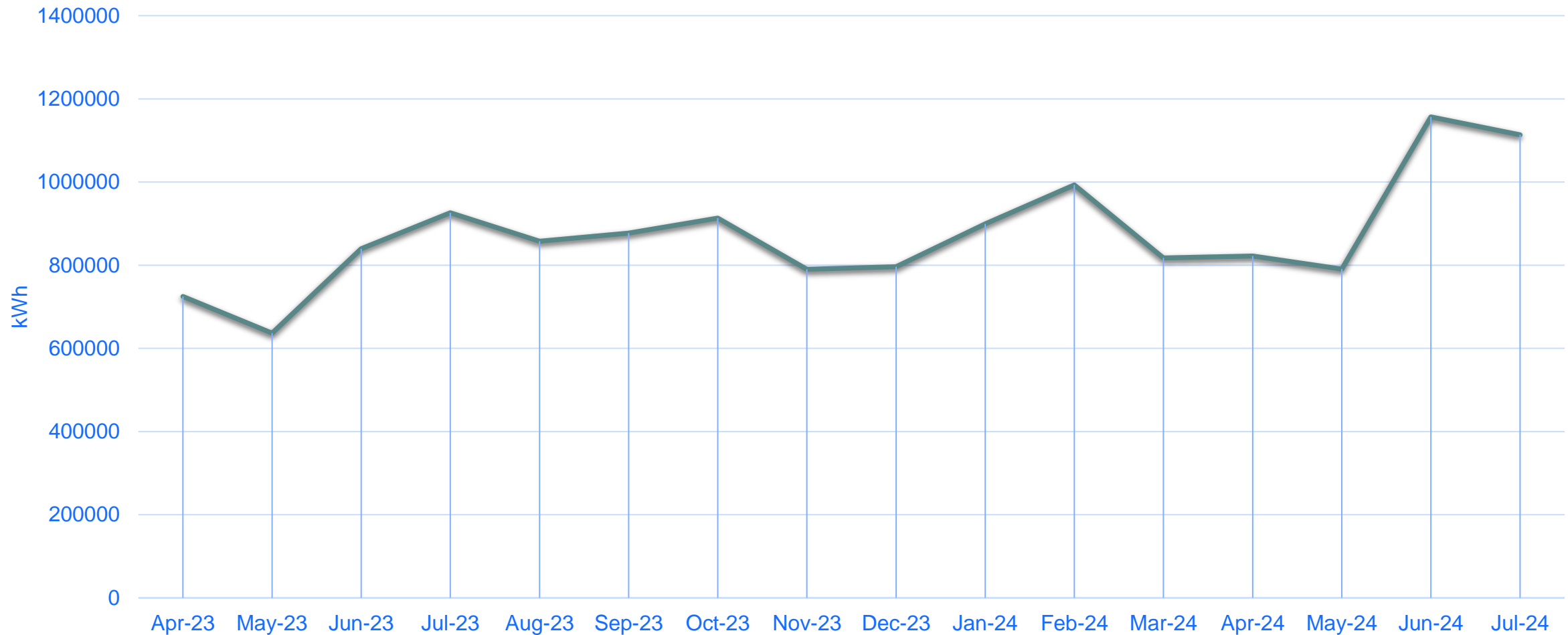
- By using Smart Meters – the cost of re-connecting a non-paying customer is cut in half.
 - A financial saving for the customer.
 - A saving for Eskom
 - No traveling costs
 - No manhour costs
- Customers can't re-connect themselves.
 - Switching is done internally within the Smart Meter.
- Eliminates the element fraud/corruption.
 - Disconnections and re-connections are managed in a centralized automated manner.

Benefits Realised – Remedial Charges Raised

	Counts	Amount
By-passed Meter	14	R84 736.40
Direct Supply	3	R24 210.40
Ghost Vending	6	R42 368.20
Illegal Meter Move (20A)	1	R480.00
Illegal Meter Move (60A)	1	R2 745.00
Grand Total	25	R154 540.00



Sales Trend (kWh)



- Clarens signed an agreement with Eskom to form part of Group Curtailment.
- Group Curtailment – a group of customers manage their load whenever a system emergency is declared as opposed to being load shed. Eskom monitors adherence very closely.
- Three consecutive instances of non-compliance results in the reinstatement of loadshedding.
- Eskom has supplemented this initiative with the installation of Smart Meters.
- Smart Meter receives a command to limit its load for a short duration during times of energy constraints.
 - Installations that don't comply – disconnected for 30 seconds.
 - Enforces compliance at customer level.
 - Not dependent of good faith/co-operation of customers.
 - DSM is managed centrally by Eskom.

Clarens, in the Free State, has become the first town in South Africa where residents are now equipped to manage their own electricity load through load curtailment.

The town is already gearing up for smart city initiatives with smart metering and electrical vehicle charging stations already installed, as well as a well-diverse spread of small-scale embedded generators.

How the small Free State town of Clarens kissed load-shedding goodbye


11th March 2024 by Editor BizNews

Town of Clarens becomes South Africa's first to manage load shedding

Teboho Setena

Express

 Comments

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Clarens leads Sandton as SA's first 'smart town' with innovative electricity management programme



By Katja Hamilton

29 Feb 2024



Future Areas of Focus



Future Areas of Focus – Improving Non-Technical Losses










- Configure and test meter alarm and event monitoring on HES.
- Develop an automated dispatching process.
- Setup a dedicated 24-hour back-office to manage this function.
 - Develop PowerBI dashboards & reports.
 - Perform Revenue Protection audit functions remotely.



Conclusion



Achievements to date:

1. Roll-out KRN2 and update customer records. 
2. Reduce Estimated accounts and meter reading costs. 
3. Reduce overdue debt. 
4. Reduce re-connection costs. 
5. Identify areas of Energy theft. 
6. Improve our Sales (kWh) 
7. Roll-out Load-Limiting 

Future Proofing our Revenue Protection Environment through Digitalization





Questions and Answers