ENERGY SERVICES MASTER PLAN

MERAFONG CITY LOCAL MUNICIPALITY

1. Purpose of this study

The purpose of this Master Plan study is to elucidate the technical problems faced by the Electrical Department of Merafong Municipality in regards to the steadily increase in electricity usage in the Merafong City Area. The analysis shall separate the Points of Delivery (POD's) of Fochville and Carletonville for better clarity. The inability of the current bulk network to sustain development in the towns while also conforming to the Occupational Health and Safety Act as well as the Quality of Electrical Supply in the Merafong City shall be highlighted.

The goals of the Electricity Master Plan for Merafong City are as follows:

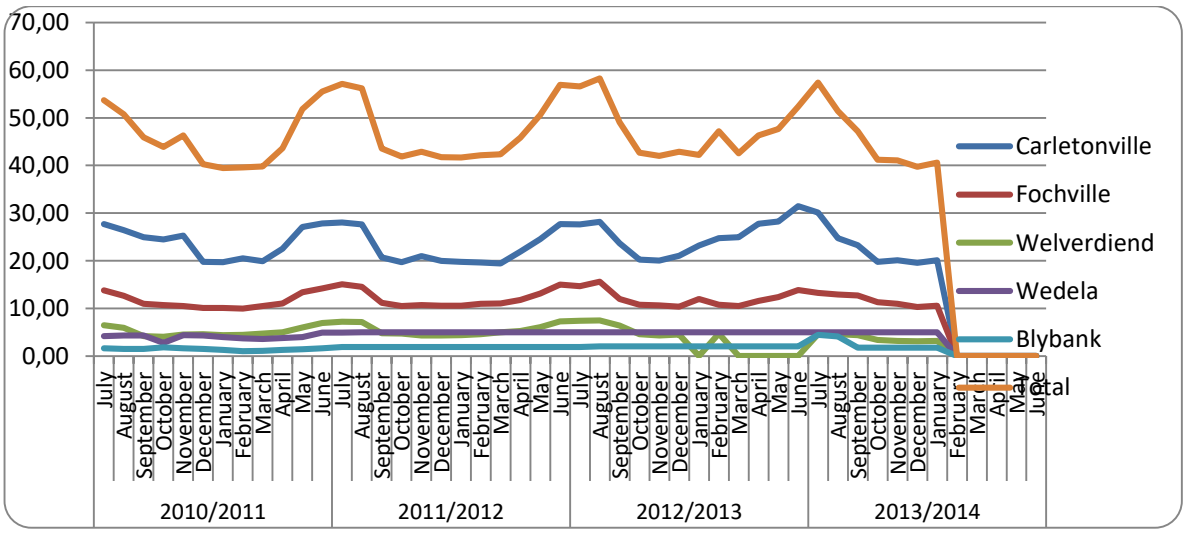
- Supporting economic growth and development;
- Improving the reliability of electricity infrastructure;
- Providing a reasonably priced electricity supply;
- Ensuring the security of electricity supply as set by a security of supply standard;
- Diversifying the primary energy sources of electricity;
- Meeting the renewable energy targets as set in the EWP;
- Increasing access to affordable energy services;
- Reducing energy usage through energy efficiency interventions;
- Accelerating household universal access to electricity;

2. Regulatory Environment

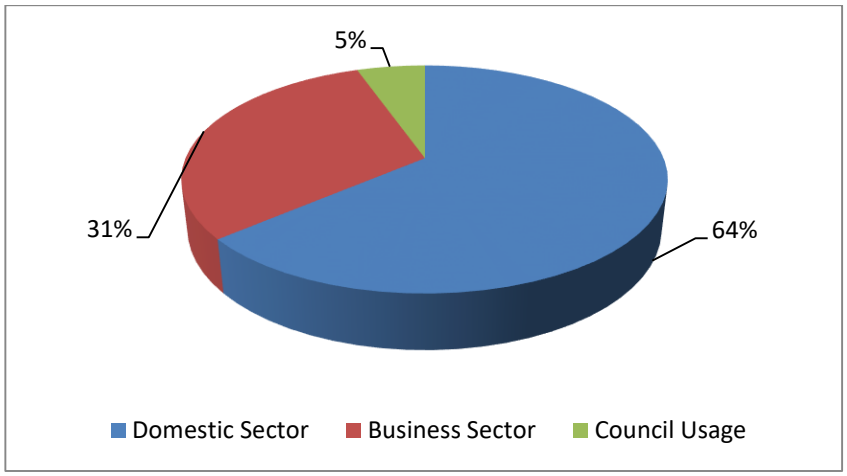
The Electricity Regulation Act was promulgated in October 2006, to replace the Electricity Act of 1987. In terms of this legislation, the Minister of Energy is entrusted with the mandate to ensure security of electricity supply. In this regard, the Minister can prescribe by regulation measures that need to be put in place to achieve the security of supply mandate.

3. Introduction

3.1. Merafong City Energy usage Demographics



Energy usage per Sector:



4. Background of Fochville Bulk Supply

The town of Fochville in the Municipal Area of the Merafong Council has seen a lot of growth in the last decade. Many people working in Johannesburg and surrounding areas decided to set up house in Fochville because of its countrified atmosphere. This resulted in large houses being built as well as normal houses being transformed in much larger houses. All of which added to the Load profile of Fochville. The Fochville town's electrical network was never designed for this kind of growth, and the aged network needs some major upgrading just to be able to deal with the current load.

The Main development area is in the Northern Part of the Fochville town where the proposed Fochville Extension 7 will be developed. Existing open stands in the Southern parts of Fochville are targeted for Cluster Housing Development which would further burden the existing network.

Prospective residents usually prefer to build new, luxury houses on the acquired property in the town while current residents extend their current houses for the dream homes they always wanted. Parallel to this, businesses built new offices and business premises which would encourage clients visiting, and promote work throughput.

Normally all these buildings mentioned above would include electrically intensive devices such as underground heating, 2 or 3 geysers, even in line geysers for immediate water heating, electrical gate motors, floodlights, swimming pool pumps /heaters, air conditioners etc.

The Bulk supply network of the Town of Fochville has been in operation for more than three decades and was never designed for the new developments that are taken place, in fact it was not even design to sustain the current electricity usage as the demand for electricity per customer keeps on rising with the adding of electrical appliances to the households.

It is recommended that major Strengthening of the Bulk network is needed in order to sustain the growth as well as to ensure the quality of Supply (As stipulated by the NRS 048 code) and to ensure the safety of the public and electricity personnel (OHSACT).

All options viable options have been considered and it is recommended that the Strengthening of the Bulk Supply network be done in three stages:

Stage 1: Strengthening of 6.6 kV Distribution network by replacing old and superannuated network equipment, and upgrading network sections that are in danger of being overloaded at any particular time of year;

Stage 2: Strengthening of Distribution Network by introducing a 132/11 kV Primary Distribution Substation to take the load of the expanding northern part of the Town of Fochville
Stage 3: Building of a Line between Old Fochville and New Fochville Substations in order to improve Reliability of both networks, providing ESKOM approves change in configuration.

5. Current Status of Bulk Substation Load

The Fochville Bulk Substation has two Distribution Transformers, one 10MVA and one 8 MVA. The winter of 2006 placed a peak load on the substation of 14MVA, thus both transformers needed to operate, and for any problems either of the transformers would have experienced, part of Fochville would have been left without power. No Transformer maintenance in the winter months is possible because of this high load that is experienced.

The Feeders out of the Bulk Substation into town, were loaded between 85% and 90% of their capacity in the past winter, thus there is only a small growth margin available before the network equipment would become overloaded.

6. Bulk Network Components

The medium Voltage network of the Town of Fochville has some network components that are in excess of three decades old. Although there are some of the equipment mentioned that might still have some serviceable lifetime left, there operation has a detrimental influence on the quality of supply to the consumers. The age and wear on some of this network equipment is of such a nature that operations on these network components may very well constitute an unnecessary risk to the operators and consumers living close to this equipment.

7. Needs Analysis (Functional Requirements)

7.1. Capacity of the Bulk Supply Substation

The Capacity of Fochville Primary Supply must be increased firstly to establish a Firm Capacity 25% (Good engineering practice entails that one should over specify load capability to accommodate growth) more than the current winter peak, which would be 14 MVA plus an additional 3.5 MVA, which give a firm supply of 17,5MVA.

Secondly additional Capacity should be installed to accommodate for the growth that Fochville town is currently experiencing and which is increasing every year. To steer away from the problem of having a lot of small transformers supply a substation with power (transformers added with small increase in capacity) which has quite a few pitfalls in terms of protection equipment needed as well as maintenance issues, it is proposed that a large

capacity transformer, such as one with a capacity of 20 MVA, is installed to ensure enough capacity for sustainable growth over the next decade.

7.2. Redundancy of the Bulk Supply Substation

The Redundancy of a Power Network is defined as the back up that exists for the event that a failure may take place, thus the function of the failed component may be absorbed by another component, while the failed component can be replaced or repaired.

Firm capacity in a power system is that capacity that the system can deliver after the primary component (usually a power transformer) fails and function is taken over by the back up network component; it is in short the capacity that can be guaranteed.

If one look at the current substation, getting a Firm (thus guaranteed) supply of 17,5MVA translates to 17, 5 MVA available for normal load and a further 17, 5 MVA on hot standby for any emergency failures or maintenance.

Any additional Capacity to be added to the Fochville Town must be doubled if it is to be regarded as Firm Capacity. This would mean a 20MVA Firm Substation would have another 20 MVA on hot stand by.

8. Compliancy with Legal Requirements – Bulk Network Components

8.1. OHS Act

The Occupational Health and Safety Act, Act 85 of 1993, Paragraph 8 sections a), be), g) and h) [Refer to Appendix A] deals with the safety of equipment. Equipment that is not safe should be made safe (if reasonable and practical) before resorting to protective clothing.

Some of the Network equipment identified on the Bulk Supply network of Fochville that needs replacement is Link Mechanisms that are air insulated with added plastic and fibreglass insulation. 30 years ago this was acceptable equipment to use, the new practice is to isolate the medium voltage links in an insulating medium and protect the operator from any induction arcs that he or she might face in opening or closing open medium voltage links.

8.2. NRS 048 Regulations

The NRS 048 – 4 Give Utilities a guide line in terms of the application of quality of supply standards. The NRS 048 – 2 identifies the parameters that might affect the normal supply of electricity. The old switchgear in the Fochville Bulk Network are from an era where it was acceptable to have an air isolated link mechanism , which on opening may draw an inductance arc.

The links are not interconnected and thus must be opened or closed independent of each other. These characteristics of the Network Components may very well materialize in high levels of the following unwanted parameters specified by the NRS 048-2 Document: *Voltage unbalance, Voltage Dips and Harmonics.*

In order for the Municipality to limit the possible violations of the NRS standard, the equipment should be replaced with other equipment whose characteristics does not lead to the existence of undesired high levels of the mentioned parameters.

9. Upgrading Voltage Level of Medium Voltage Bulk Supply

The Town of Fochville is supplied on the Medium Voltage at a voltage of 6, 6 kV. This voltage level was typically used for the mines that existed in Merafong before a town of the magnitude of Fochville was ever envisaged. The town inherited the voltage for their electrical network because this was all that was available.

The 6, 6 kV voltage is however not ideal to transmit power because of the losses involved and the problem of substantial voltage drop over large distances. The Voltage level of 11 kV is much better suited for bulk Medium Voltage Supply in a town environment, and has been established in South Africa as the medium Voltage of Choice for Municipalities.

(Although 22 kV has been investigated by a few municipalities, the excessive cost of 22 kV Switchgear has basically forced 22 kV out of the equation for medium voltage bulk distribution in towns and cities) It is therefore in the best interest of the town of Fochville to seriously consider a system that can supply power at a voltage of 11 kV to the Bulk Supply Network.

10. Supervisory Control and Data Acquisition

The Electrical Network of Merafong City Local Municipality currently does not have the functionality of Supervisory Control and Data Acquisition. Problems on the network are identified via consumers calling in and reporting power outages. Any new developments in the Fochville supply area needs to have the option to develop this functionality in order to prevent prolonged outage times.

11. Overview of Functional Requirements

*The Solution endeavoured for the Load Problem in Fochville must therefore address all of the following requirements**:***

11.1. Bulk Network Capacity

11.1.1. Adequate Capacity for Current Load Profile
11.1.2. Adequate Capacity for Future Load Profile
11.1.3. Redundancy for current System
11.1.4. Redundancy for Future System
11.1.5. Compliance with NRS 048 regulation
11.1.6. Upgrading of 6, 6 kV to 11 kV
11.1.7. Prepare for Supervisory System

- Applications for more capacity have been submitted to Eskom to address this matter and negotiation on the configurations, available capacity and timeframes began in 2008 and are at an advanced stage.

11.2. Aged Network Components

11.2.1. Adequate Capacity for Current Load Profile
11.2.2. Adequate Capacity for Future Load Profile
11.2.3. Redundancy for current System
11.2.4. Redundancy for Future System
11.2.5. Compliance with OHS Act
11.2.6. Compliance with NRS 048 regulation
11.2.7. Upgrading of 6, 6 kV to 11 kV
11.2.8. Prepare for Supervisory System

- This is being addressed presently with the Bulk Upgrading project that is underway with an expected completion date of 2016.

12. Background to the Bulk Supply Area of Carletonville

The Town of Carletonville was proclaimed in 1948 and became a Municipality 11 years later in 1959. It therefore suffices to say then that some parts of the Carletonville network is in excess of 40 years old.

The Electricity Department responsible for the town's network has over the years done its utmost best in keeping the electricity supply safe and reliable to all its consumers. Limited budgets had the effect that the minimum equipment necessary to function were installed in the 44v kV Bulk Supply Substations of Carletonville. Some of this equipment has now come to the end of their serviceable life and needs to be replaced or upgraded.

Other equipment which was omitted in order to comply with limited budgets is now deemed necessary to be installed in order to comply with the service levels proposed by the National Electricity Regulator in the NRS 048 document. It is now no longer an acceptable practice to have a fault on a part of the network to bring darkness to other parts of the network as there are equipment available that can isolate the faulted network part without the rest of the network being influenced.

The following 44 kV Bulk Supply substations needs upgrading and refurbishment: Frikkie van der Merwe, Bloukrans, and Khutsong South.

The Merafong City Council has identified 20325 stands in the Municipal Area to be developed to form the new Khutsong Town with extensions 1, 2 and 3.

There is no Electrical Substation in existence to service the electricity needs of these new extensions to be developed. It is however possible to service some of the initial houses to be build in the new suburb for a limited time with supply from the nearby town of Carletonville.

This solution however is limited and for the development of all identified stands in the new Khutsong Town, the Suburb should be supplied via a High Voltage (HV) Bulk Supply Substation.

The three extensions of the new Khutsong were divided into 6 development areas. These development areas will differ in After Diversity Maximum Demand, and will be completed in

different phases. It is therefore imperative that each of the development areas be supplied by an 11kV Bulk Supply Substation in order not to compromise the area development.

13.5. Needs Analysis (Functional Requirements)

14. Overview of Functional Requirements

The Solution endeavoured for the substations identified in the Merafong City Local Municipality must therefore address all of the following requirements:

14.1. New Khutsong Town HV Bulk Supply Substation

14.2. Carletonville Town 44 kV Bulk Supply Substations (Frikkie van der Merwe,Khutsong South, Bloukrans)

14.2.1. Adequate Capacity for Future Load Profile
14.2.2. Redundancy for current System
14.2.3. Redundancy for Future System
14.2.4. Compliance with NRS 048 regulations: Lightning, Interruptions
14.2.5. Protection Scheme
14.2.6. Prepare for Supervisory System
14.2.7. Compliance with Batho Pele
14.2.8. Khutsong / Carletonville systems integration

15. Options Analysis

15.1. Voltage Level: 44 kV

One option to supply the new Khutsong Town Substation would be to use the 44 kV from ESKOM that is available in the area. This solution is dependant on ESKOM having capacity from the Wes Wits Substation to supply Merafong with extra Power on the 44 kV level.

15.2. Voltage Level: 132 kV

The new Khutsong Town Substation can also be supplied via the 132 kV from ESKOM. This is again dependant on ESKOM having the Capacity to support a new High Voltage Bulk Supply Substation on the 132 kV level.

15.3. Voltage Level: 275 kV

The only other voltage level that is available in the area is that of ESKOM 275 kV. This voltage is regarded as being a Transmission Voltage and not a Distribution voltage, and capacity on the 275 kV network from ESKOM must be available.

16. Existing 44 kV Bulk Supply Substations in Carletonville

16.1. Capacity

Substations must have enough firm Capacity available in order to supply current customers as well as to sustain growth in the near future (5 years).

16.2. Redundancy

In the event of a major equipment failure such as a transformer, substations without redundancy will not be able to supply power until such time that the equipment is fixed. All electrical equipment, including transformers is just as good as the manufacturer made them, and how they are treated by the operators and the environment. Failure of these equipment is inevitable, the mean time to this failure however is a variable, may happen at any time, it is therefore crucial that the Council PROCURE & PREPARE for such an failure.

16.3. Protection Schemes

The Protection Schemes of all the substations must be revised to be on par with current accepted Protection Schemes that would clear any fault on the system in the minimum possible time in order to limit any damage to the equipment.

16.4. Supervisory Control and Data Acquisition System

Substations without Supervisory Control Systems must be equipped with the necessary equipment to allow for the Remote Control and Data Acquisition of the said substation.

17. Available Capacity on ESKOM Network

Network Development Planners at ESKOM who deal with the Merafong area of supply, indicated that ESKOM can only supply Capacity to the Merafong Council via the 44 kV network if Strengthening of the Network can be done which is; according to ESKOM; a major expenditure which the Merafong City would have to be prepared to help finance. There is however, capacity available on the 132 kV network running through Merafong Council's boundaries.

18. Options Due Diligence

18.1. Voltage Level: 44 kV

Practical Feasibility

Practical, There is 44 kV lines in the vicinity although a line of around 5 km will need to be built.

Financial Feasibility

Not Feasible, ESKOM will have to be paid to do a Major upgrade on their network in order to be able to supply the new Khutsong Town Substation.

Risk Feasibility

Risk is not too high, as similar projects have been successfully completed and standard equipment manufactured in the Republic of South Africa can be used. Risk of excessive long project life does exist which increases other risks.

Technical Feasibility

Option is Technical Feasible, voltage does exist, standard equipment to be used manufactured and supported in South Africa.

Environmental Feasibility
Environmental Feasibility can only be established once an Environmental Impact Study has been done on the line to be built as well as the substation. Because of the length of the line, this option would have a definite effect on the environment.

Operational Feasibility
The Current Operations of the Merafong Municipality's electrical department falls within the scope of operating such a substation, and therefore it would be operational feasible.

Major Pitfalls of this Option
Need to build a 44 kV line, Extra Cost, Extra Project Life
Need to fund ESKOM for strengthening the network on 44 kV side, Extra Cost

Major Advantages of this Option
·44 kV interconnectivity with other High Voltage Bulk Supply substations can be established to improve redundancy.

18.2. Voltage Level: 132 kV

Practical Feasibility
Practical, although short line, maximum 3 kilometers to be built to connect to the ESKOM 132 kV supply.

Financial Feasibility
It is Financially Feasible to supply the capacity of the new Khutsong Town Substation on the 132 kV level.

Risk Feasibility
Risk is not high, as similar projects have been successfully completed and standard equipment manufactured in the Republic of South Africa can be used.

Technical Feasibility
Option is Technical Feasible, voltage does exist, standard equipment to be used.

Environmental Feasibility
Environmental Feasibility can only be established once an Environmental Impact Study has been done on the line to be built as well as the substation. Because of the length of the line, this option would have a definite effect on the environment.

Operational Feasibility
The Current Operations of the Merafong Municipality's electrical department does not support the 132 kV level, though people can be trained to operate as it is allowed by ESKOM for a utility to do switching on the 132 kV level. 132 kV is not regarded by ESKOM as a Transmission Voltage but rather a Distribution Voltage.

Major Pitfall of this Option
·Nothing done for Redundancy of Source Supply, Redundancy must be addressed in juxtaposition with ESKOM at a latter stage.

Major Advantages of this Option

- Available Capacity from ESKOM
- Line to be build is less than 3 km in length

19. Findings and Conclusions

19.1. Carletonville Town 44 kV Bulk Supply Substations (Frikkie van der Merwe, Khutsong South, Bloukrans)

In order to conform to the NRS 048 standard, legal insurance requirements as well as the Batho Pele principles , the following issues at all the mentioned substations must be addressed: Issues of Capacity, Redundancy, Protection Schemes, Supervisory Control and Data Acquisition System and the Lightning protection equipment.

19.2. The New Khutsong South Township HV Bulk Supply Substation

From the possible voltage level options that may be used to supply the new Khutsong Town Substation, only the 132 kV option proves to be feasible. The options at the 44 kV and 275 kV levels are too expensive and the risk is very high.

Arising from the Feasibility Study, it can be concluded that supplying the new Khutsong Town Substation at a voltage of 132 kV from ESKOM is technically, environmentally (pending an EIA), Practically, Financially, Risk wise, Legally and Operationally feasible

20. Recommendations and Identified Programmes

20.1. The 132 kV Bulk Supply Substation

A new Complete 132 kV Bulk Supply Substation of 40 MVA be built (Pending an Environmental Impact Assessment) to Supply the New Khutsong Town A 132 kV line be built to connect to the ESKOM 132 kV point of Supply

20.2. The 11 kV Bulk Supply Substations

Six Complete 11 kV Bulk Supply Substations be built in the six different development Areas in the New Khutsong Townships.

20.3. Frikkie van der Merwe Substation

Implement Earth fault Detection and Earth fault Protection Tripping
Install Surge Arresters and Lightning masts
Refurbish Protection Schemes
Upgrade 44 kV Panels
Add 10 MVA TX to ensure 10 MVA firm capacity
Renovate gantry and bus bar configurations
Install new gantry and bus bar
Introduce SCADA Functionality
Sub yard and enclosure Maintenance

20.4. Khutsong South Substation

Add 5 Additional Breaker Panels
Install Surge Arresters and Lightning masts
Implement Earth fault Detection and Earth fault Protection Tripping
Refurbish Protection Schemes
Add 10 MVA TX to ensure 10 MVA firm capacity
Renovate gantry and busbar configurations
Install new gantry and busbar
OCB Configuration change
Introduce SCADA Functionality

20.5. Bloukrans Substation

Implement Earth fault Detection and Earth fault Protection Tripping
Add 4 Additional Breaker Panels on 11 kV
Add 4 Additional Breaker Panels on 6.6 kV
Install Surge Arresters and Lightning masts
Renovate gantry and busbar configurations
Install new gantry and busbar
Install one new 44 kV Breaker on the line to Reinecke Substation
Refurbish Protection Scheme on 44 kV Panel
Install Earth fault current limiting Equipment in all Four Auto Transformers
Introduce SCADA Functionality

21. Notes

21.1. Enlargement of Bulk Capacity

ESKOM has been officially informed via letter about the planned project by the Merafong Council. The letter included the following:

☐Expected time of Completion of Project
☐Expected Demand Forecast
☐Time of Deliverables expected from ESKOM
☐Type of Load expected
☐After Diversity Demand Forecast of the Load
☐Estimated Power Factor of the Load

22. Projects and programmes Identifies

PROJECT:	BUDGET	14/15	15/16	16/17
1. Fochville Bulk Substation – ESKOM	R12,000,000	7,000,000	5,000,000	
2. Load control relays replacement and audit	R4,000,000	2,000,000	2,000,000	
3. Rural Ring Feeder	R650,000		650,000	
4. Bulk Supply C/ville	R74,000,000		10,000,000	64,000,000
5. Street lights – Merafong Ph. 2	R25,722,765	6,000,000	6,500,000	13,222,765
6. Khutsong South Extensions Electrification	R62,400,000		32,800,000	29,600,000
7.Khutsong South new 11kv main substation	R40,000,000		30,000,000	10,000,000
8. Lighting – N12/R500 Crossing	R3,000,000		2,000,000	1,000,000

9. Kokosi Ext 6 Electrification 2138 stands	R25,656,000		25,656,000	
10. Load Control Upgrade	R7,000,000	400,000	2,500,000	4,100,000
11. Fochville – LV Network	R1,000,000		800,000	200,000
12. Christmas Lights	R750,000	500,000	250,000	
13. Wedela 5MVA TRF	R2,700,000		2,700,000	
14. Blesbok Ring feeder	R600,000		600,000	
15. Khutsong South Extensions Electrification Ph3 stands	R31,140,000	10,000,000	21,140,000	
16. Open Space Lighting	R4,500,000	500,000	2,000,000	2,000,000
17. Streetlight Conversion Phase 2	R10,491,230		6,411,307	4,079,923
18. Streetlights Internal	R1,050,000	150,000	300,000	600,000
19. Khutsong South 10MVA 44/11TRF	R3,000,000		3,000,000	
20. Bulk supply Khutsong South secondary networ	R61,055,000	21,000,000	17,500,000	22,555,000
21. Fochville Main Substation Upgrade	R15,000,000	15,000,000		
22. Khutsong South Bulk Substation - ESKOM	R60,000,000	10,000,000	30,000,000	20,000,000
23. Kokosi Ext 7 Electrification 2225 stands	R24,475,000		24,475,000	
24. Streetlights Khutsong 14852 Stands PH 2	R8,000,000		4,000,000	4,000,000
25. Khutsong Bulk Electricity Phase 2	R80,000,000		40,000,000	40,000,000
26. Carletonville Ext 17	R24,574,000		24,574,000	

23.Street and Public lighting

23.1. Status Quo of the Service

	125w	200w	250w	400w	150w	70w	100w	Total Number of Lights`
Fochville	1906	0	146	259	15	164	100	2590
C/ville	1026	554	1550	14				3144
Wedela	947	0	23	6	32	0	0	1008
Kokosi	317		10	160	51	88		626
Khutsong	732		292	227				1251
Khutsong South	776		24					800
Welverdiend	299		92					391

Blybank	202						10	212
Greenspark	254		44					298
Total	**6459**	**554**	**2181**	**666**	**98**	**252**	**110**	**10320**

23.2. Conversion to Energy Efficient Lighting

In terms of the energy efficiency regulations as promulgated by the department of Minerals and Energy, all utilities shall have to convert their street lighting to energy efficient technologies for power conservation.

The study as for such an exercise in Merafong City has been conducted and the cost estimates are as follows:

	Total Number of Lights`	**Cost**
Fochville	2590	R 1,813,000.00
C/ville	3144	R 2,200,800.00
Wedela	1008	R 705,600.00
Kokosi	626	R 438,200.00
Khutsong	1251	R 875,700.00
Khutdong South	800	R 560,000.00
Welverdiend	391	R 273,700.00
Blybank	212	R 148,400.00
Greenspark	298	R 208,600.00
Total	10320	R 7,224,000.00

Provision for the programme has been identified, costed and provided for in the MTEF budget of Council as well as in the Integrated Development Plan.

24. Energy efficiency and Demand Side Management

24.1 Background

The term 'demand-side management' (DSM) was first used in the United States in the early 1980s to describe the 'planning and implementation of utility activities designed to influence the time, pattern and/or amount of electricity demand in ways that would increase customer satisfaction, and co-incidentally produce desired changes in the utility's load-shape' (Gellings 1989).

In South Africa, DSM is still a relatively new concept to most. While Eskom formally recognised DSM in 1992 when integrated electricity planning (IEP) was first introduced, the first DSM plan was only produced in 1994. In this plan, the role of DSM was established and a wide range of DSM opportunities and alternatives available to Eskom were identified (Ellman & Alberts 1999). Some municipalities and local service providers currently undertake activities seeking to 'produce desired changes in the utility's load shape'. Some of these activities can be classified as

DSM initiatives, others not. The reason for this, generally, is that this latter group of activities tends to focus on achieving load impacts, and are not necessarily geared towards bringing about increased customer satisfaction.

In the White Paper on Energy Policy, the South African government recognises the importance and potential of energy efficiency, and commits itself to promoting the efficient use of energy in all demand sectors. It also commits itself to investigating the establishment of 'appropriate institutional infrastructure and capacity for the implementation of energy efficiency strategies'.

DSM is applicable to any customer who, through an initial walk through audit, is identified with potential to implement specific initiatives. This includes sectors such as:

- Commercial sector e.g. (Hospitality sector, Tertiary institutions, Government & private hospitals, correctional services establishments, office parks)
- Industrial sector e.g. (mining, steel, petroleum etc)
- Redistributors & Residential sector e.g. (municipalities, residences)
- Hospitality sector
- Hotels
- Tertiary Institutions
- Government and private hospitals
- Correctional services establishments

24.2 DSM Acceleration

DSM could be accelerated through the following interventions:
- De-marketing to gas (cooking)
- De-marketing to gas (space heating)
- Acceleration of Efficient Lighting
- Industrial and Mining Load Control
- Industrial and Mining Efficiency
- Geyser Load Control
- Solar Water Heating
- Intelligent/Smart metering

Merafong City has initiated the process of DSM Measures for Municipal and Gevernment buildings which shall commence in 2014 and the Solar Water heating programme that shall commence in 2015