

## Setting up an SSEG application and approval system in a municipality

NMBMM (meeting 26 Feb 2018)

(see attendance register for participants)

Support area	Detail / notes / support needed	Status
Developing an SSEG policy (optional)	Not needed – munic has strong RE policy already	
<b>Develop documentation</b>		
Requirements for Embedded Generation	Document in draft form. Various edits were proposed in a detailed review by the workshop. <b><u>Mark to edit accordingly.</u></b> NMBMM to integrate their own Tariffs and Application Processes document into it, so one document has all the necessary information.	Done. Email 6/3/2018
Application form for SSEG	A relatively detailed application form exists which draws on the AMEU standard document. Faure suggested various edits. <b><u>Faure to send suggestions to Corrie for attention.</u></b>	Done. Email 6/3/2018
Commissioning form	Using AMEU Standard doc. NMBMM Sign-off criteria different tho (se of GreenCard installers, and PrEng etc only >30kWp. Approval letter once successfully commissioned: <b><u>Faure to email Cape Town's example letter.</u></b>	Done. Email 6/3/2018
Supplemental SSEG contract	Reviewed and edited during workshop. <b><u>Mark to include edits.</u></b> They will then send to Legal section for review.	Done. Email 6/3/2018
Decommissioning form	Using AMEU Standard doc.	
Public info brochure	Under consideration. They will potentially draw on Cape Town's 'Safe and Legal SSEG installations' brochure. Estate agents should also be informed of implications when buying/selling houses.	
<b>Internal process</b>		
<b>Process Flow</b> (for an SSEG application)	<b>They feel this is needed.</b> Current process not very rigorous. Will need to be paper-based initially. The NMBMM group will arrange a session with relevant staff to delineate the flow and formalise it.	
<b>Control Document</b> (checklist)	(as above)	
<b>Tariff setting</b>		
Deciding on a suitable SSEG tariff and enabling it on the municipal billing system	They are interested in looking at the revenue impact of their tariffs, but not a current priority as all tariffs are in place.	
<b>Metering</b>		

Procuring bi-directional meters	They have procured, and have significant experience with a range on bi-directional meters (Mark has this list - useful to communicate with other munics facing this issue)	
<b>By-law amendment</b>		
Amending the electricity bylaw to accommodate SSEG	They are in the process of amending the by-law and have SSEG clauses in already. <b><u>Mark/Faure provide comments for them to take into account</u></b> (e.g. referring to the 'Requirements' document to give it mandatory status)	Done (during meeting)
<b>Grid impact studies</b>		
<b>Grid Impact study guidelines</b>	<b><u>Mark / Faure to provide Grid Impact Study guidelines once they become available.</u></b>	Not done
<b>Training of staff</b> to be involved in SSEG assessments etc		
Processing an application (NRS097-2-3; NRS097-2-1; etc)	General staff capacity: They are planning to hold a staff training session regarding SSEG. They are concerned about staff capacity to deal with SSEG applications. <b><u>Mark to send info/organogram of Cape Town SSEG-related staff for info.</u></b>	Done. Email 10/03/2018
System commissioning	(as above)	
<b>Record keeping</b> (minimum requirements) <b>and IT</b>		
Keeping a register of key information (for NERSA)	Currently have a spreadsheet for all SSEG applications. Should be easy to send NERSA the necessary information when required.	
Keeping a record of exact SSEG location on network/feeders	They collect GIS co-ordinates for each SSEG installation (on Application form), so will be able to transfer these to a GIS system to enable 'cumulative SSEGs on feeders' assessments in future.	
Engaging with <b>municipal IT section/s</b> (SAP? SmallWorld? Etc)	Potentially for future.	
<b>Informing the public</b>		
<b>Develop and disseminate information brochure</b> for the public	(see earlier)	
<b>OTHER TO DOs</b>	<b><u>Mark/Faure to write a report for NMBMM indicating where attention is needed, capacity is inadequate etc</u></b> (to help them make a case for capacity etc with senior management)	Done. Email 9/3/2018

# SMALL-SCALE EMBEDDED GENERATION (SSEG) IN NELSON MANDELA METROPOLITAN MUNICIPALITY (NMBMM)

## REVIEW OF THE MUNICIPAL SSEG APPLICATION PROCESS, AND RECOMMENDATIONS TO BRING IT TO EFFECTIVE OPERATION

March 2018

Undertaken by: *Mark Borchers and Faure van Schalkwyk (SunCybernetics / Sustainable Energy Africa consortium) as part of the GIZ programme to support municipalities with the adoption of SSEGs*

Submitted to: *Corrie Schmidt, Electricity and Energy Department, NMBMM*

### Introduction

The majority of municipalities in South Africa are experiencing a growth in SSEG systems and are under obligation to develop processes to enable potential SSEG customers to connect to municipal distribution networks in a safe and legal manner. This is also the case in NMBMM, where applications for SSEG connection to the distribution network are increasing. The municipality has made significant progress in establishing systems and developing documentation to accommodate SSEG systems onto the municipal network. Based on a review of the already developed documentation and a workshop with relevant staff from NMBMM Electricity and Energy Department on the 26<sup>th</sup> February 2018, the status and recommended next steps to operationalize the system are presented in this report.

### SSEG areas covered and recommended actions to operationalize

#### Specifying the requirements for connection

NMBMM has a draft *Requirements for Embedded Generation* document which includes the conditions under which SSEG systems will be accepted onto the distribution grid, provides general information for the prospective SSEG customer, and details the process to be followed to apply to connect to the distribution grid. The important areas of registered personnel signoff, reverse feed compensation, metering, inverter safety and power quality certification, and commissioning requirements are covered. The document is both to inform prospective SSEG customers as well as to form a mandatory framework for SSEG application and connection (the *Requirements* document is made mandatory through being referred to in the by-law – see later section). The document is based on the AMEU/SALGA Standard document for this purpose, and is considered sound.

Various edits were identified at the workshop of 26<sup>th</sup> Feb 2018 to finalise the document. NMBMM has also developed a separate document describing the SSEG tariff and application process. These documents should be merged into one *Requirements* document.

#### Recommendations:

1. Undertake edits to the document as identified at the 26<sup>th</sup> Feb 2018 workshop
2. Merge the pre-existing document describing the SSEG tariffs and application process into the Requirements document so there is just one comprehensive source of information on the topic.

#### The legal framework

The municipality must be able to enforce compliance with its requirements around SSEG connection – through court action if necessary. Its connection conditions – including that customers need to complete a formal application

process and adhere to the conditions and parameters in the Requirements document, need to be mandatory. The Electricity and Energy Department is doing this through suitable clauses in the revision of the Electricity by-law, which is considered a sound approach. The draft revised by-law includes the necessary clauses.

#### Recommendations:

1. Ensure that the Electricity by-law is amended to include clauses which:
  - a. Require written permission of the municipality before SSEG connection
  - b. Require a formal application process to be undertaken to request permission
  - c. Require adherence to the specifications and provisions in the *Requirement* document

#### The application, commissioning and decommissioning forms

The Electricity and Energy Department has drafts of all of the necessary forms for application, commissioning and decommissioning. These are based on the AMEU/SALGA Standard Forms for this purpose, and have been customized for NMBMM's purposes. The forms are generally thorough and serve NMBMM's purpose well.

The commissioning form needs further edits to reflect registered personnel signoff requirements (which are also reflected in the *Requirements* document) which were discussed at the 26 Feb workshop.

#### Recommendations:

1. The Commissioning Form should be edited to reflect the following signoff requirements:
  - a. Systems up to 30kWp: signoff by PV GreenCard accredited installer
  - b. Systems over 30kWp: signoff by ECSA-registered Pr Eng or Pr Tech Eng, and signoff by PV GreenCard accredited installer
  - c. All systems, irrespective of size require a Certificate of Compliance (CoC) according to SANS10142-1 (and SANS10142-1-X when published).

#### The Supplemental SSEG Contract

Existing supply agreements with normal customers do not adequately cover issues pertaining to SSEG, and therefore SSEG customers should sign a Supplemental SSEG contract upon system commissioning. This specifies the rights and obligations of the municipality and the customer. NMBMM has a draft SSEG contract based on the AMEU/SALGA Standard SSEG Contract. Various required edits were identified for the contract at the 26 Feb workshop.

#### Recommendations:

1. Finalise the draft SSEG contract by including the edits identified.

#### SSEG Tariff development

SSEG tariffs differ from tariffs of conventional customers in the same category (e.g. residential, commercial) as they require a fixed charge to cover fixed costs of grid availability, reverse feed compensation, and an energy consumption tariff (called an SSEG 3-part tariff). Best practice is to have SSEG time-of-use tariffs for all customers, including residential.

NMBMM has an existing SSEG 3-part time-of-use tariff for residential customers, and therefore is following best practice. NMBMM has requested assistance with assessing the revenue impact of their current SSEG tariffs, as well as looking at tariffs for commercial and industrial customers. **To this end the SunCybernetics/SEA consortium will provide a report to support tariff setting and revenue impact assessment.**

#### Recommendations:

1. Based on the SSEG tariff revenue impact assessment to be undertaken:
  - a. Reassess residential SSEG tariffs
  - b. Develop commercial and industrial SSEG tariffs for submission to NERSA in 2019.

## Staff capacity to process applications and engage with SSEG customers

For an effective SSEG application and approval process to exist, staff capacity needs to be appropriate. With the observed increase of SSEG installations and applications – a trend which is only expected to accelerate – comes additional demands on staff. To address this, firstly, staff need to undergo training to be able to effectively process applications, participate in commissioning where necessary, and deal with queries and problems arising from non-conventional or complex applications. Secondly, additional staff capacity is needed because of the significant increase in time demands that these activities place on municipal personnel. Generally, municipal electricity department staff do not have spare capacity to allocate to this, and simply expecting existing staff to cope with a growing burden of SSEG applications and related work is not sustainable.

Several NMBMM Electricity and Energy Department staff have undergone SSEG training. Also, the Electricity and Energy Training Centre has co-hosted such training and is gearing up to provide further SSEG courses in-house as well as for external parties. However, no additional staff capacity yet exists to deal with the added workload that comes with an effective SSEG processing system. Other municipalities around the country also struggle with the issue of staff capacity, and it is unusual to find dedicated staff for this purpose. Tshwane is an exception, where the Renewable Energy Office within the Energy and Electricity Department has two staff focusing on SSEG systems and application processing. Cape Town has one staff member dedicated to Renewable Energy generally, under which SSEG falls, although SSEG applications are handled by existing staff in area offices, metering sections etc, and thus they also face the issue of increasingly unsustainable workloads. This is recognized as a problem.

In NMBMM staff capacity should be allocated to deal with SSEG applications and related work. This could be by a clear change in job descriptions of at least two staff members to cover SSEG, but given current workloads, it is likely that additional capacity will be needed.

### Recommendations:

1. Allocate staff to SSEG issues specifically, and procure extra capacity to achieve this. Two staff members, whose functions largely revolve around SSEG, are likely to be required in the medium-term.

## Application processing steps

Assessing an SSEG application involves several steps, including engagement with different department sections such as network planning, inspectorate and protection. Conformance with provisions in the NRS097-2-3 (Simplified Connection Criteria) need to be assessed, including looking at system sizes for different LV feeders and upstream MV impact. Compliance with NRS097-2-1 is also necessary. Given that significant numbers of SSEG applications are expected, a streamlined process needs to be in place to deal with them. NMBMM should look to clarifying this process and streamlining it where possible. A first step to this is an agreed-upon set of steps, with an associated Control Document which is attached to each SSEG application to guide it through and track progress.

### Recommendation:

1. Develop a clear application assessment process with associated Control Document, which specifies each step in the process as well as identifying responsible sections for each step.
2. Obtain inputs and consensus regarding the process – for example through an internal workshop.
3. While this Control Document would probably be paper-based initially, it could be software-based in the medium-term, which would facilitate tracking of each application.

## Bi-directional metering

NMBMM accepts reverse feed of SSEG systems onto the municipal distribution grid, which is considered best practice and is to be supported. The Municipality has experience with bi-directional meters to enable appropriate billing, and has stock of such meters, and is thus adequately prepared for SSEG acceleration from this perspective.

## Grid-impact studies

The NRS097-2-3 provides a range of parameters under which SSEG systems can be accepted on the distribution grid without fear of negative impact on the grid. Applications which fall within these parameters can be relatively quickly processed. However, a number of SSEG applications fall outside of these parameters, and the NRS097-2-3 is clear that such systems should not be declined permission, but require further investigation in terms of grid impact studies. Currently there is little guidance as to what these grid impact studies need to cover, and what acceptable parameter ranges are from various scenarios tested. **GIZ is currently developing such grid impact study guidelines.**

### Recommendations:

1. Adopt the grid impact study guidelines being developed by GIZ, and customize as necessary.

## Record keeping

There are various reasons to develop adequate record keeping systems for SSEGs on the municipal grid. Other than having a database of SSEG systems for general municipal purposes, the municipality needs to:

- Record a specific set of information on each SSEG customer to submit to NERSA periodically (see draft list in Appendix).
- Record the location of each SSEG system on their network to enable assessment of new applications in terms of the cumulative impact of SSEG on LV feeders and MV networks. This is important to ensure that cumulative impacts do not have potential for negative impacts on the grid, according to the guidance in the NRS097-2-3.

NMBMM has an existing database which records SSEG system and customer data, including GPS coordinates.

### Recommendations:

1. Ensure that the existing SSEG database adequately captures the information that is likely to be required by NERSA, and that the information can be easily exported for submission to NERSA when required.
2. Implement a method of transferring SSEG GIS location onto the distribution grid GIS mapping system, including key SSEG system information such as system size (kWp), so that the cumulative impact of SSEG on the distribution network can be tracked in terms of the guidance in the NRS097-2-3.

## Public communication

Once the key parts of the SSEG application process are in place, this should be communicated to the public, including the fact that obtaining written approval is mandatory. There is an urgency in communicating the information in the *Requirements for Embedded Generation* document to the public to avoid non-compliant SSEG systems being installed (it is often very difficult for non-compliant systems to become compliant once installed).

### Recommendation:

1. Develop a user-friendly pamphlet or other communication to inform the public of the existence and key requirements of the SSEG application process (this could draw on the Cape Town 'Safe and Legal SSEG Installations' document for this purpose).

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## Appendix

### Information on each SSEG customer to be submitted to NERSA

NERSA has indicated that they will require information on all SSEG installations. The draft list of information to be submitted for each SSEG system is below (Note: this should be checked with NERSA to ensure it reflects their latest position):

1. ID of installation
2. Generator technology (PV/wind/biogas/diesel/fuel cell/generation)
3. Type of installation (rooftop/ground-mounted/building integrated)
4. Newly built capacity or capacity extension of an existing system.
5. License exemption classification (according to DoE License Exemption Notice).
6. Date of connection agreement
7. Date of registration of the installation
8. Date of commissioning of the installation
9. Date of decommissioning of the installation
10. Installed capacity: kW at grid connection point
11. Installed module capacity (PV only): kWp of installed modules
12. Location of SSEG system (street name, house number, city, zip code, GPS coordinates)
13. System includes storage (yes/no). Storage capacity in kWh (if yes). Storage for grid tied operation (yes/no).
14. ...and any other information, which is required by NERSA as detailed by the corresponding regulation.