

Guidelines for small scale embedded generation in Western Cape municipalities



Guidelines on the application process to become an embedded generator in the Municipality of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Disclaimer of liability

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# Information on these guidelines

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| --- | --- | --- | --- |
| **Guideline Title** | Small scale embedded generation guidelines for Western Cape municipalities | | |
| **Document Version** | V7 | **Document Status** | Review & external comments |
|  |  | | |
| **Guideline Goals** | The parallel connection of any generator to the municipal electrical grid, however powered, has numerous implications for the local municipality. It should therefore be regulated and managed. The goals of this guideline are to:   * Ensure the safety of the municipal staff, the public and the user of the SSEG installation. * Mitigate the impact of the physical presence of the SSEG installation on neighbours (e.g. visual, noise). * Mitigate the impact on the quality of the municipal electricity supply, and metering and billing issues. * Mitigate the impact on cross subsidisation of indigent customers and other municipal services. * Promote growth in the SSEG industry by creating a conducive environment for growth. | | |
| **Intended outcome** | The purpose of this document is to give each stakeholder relevant guidance regarding the draft municipal SSEG rules, regulations, tariffs and application process.  Sections highlighted in yellow can be changed in order to tailor the documents for specific circumstances and/or municipalities. | | |
| **Scope** | This document covers:  The connection of SSEG to the municipal electrical grid only  Installations smaller than 1MW peak.  On-grid (grid tied and grid limited) and off-grid SSEG installations.  installations for “self-consumption” only  This document does not cover:  Wheeling regulations  The connection of SSEG to the Eskom electrical grid.  Inverter testing regulations and procedures | | |
| **Defining small scale embedded generation** | Small scale embedded generation (SSEG) refers to power generation under 1MW/1000kW, which is located on residential, commercial or industrial sites where electricity is also consumed. SSEG is in contrast to large-scale generation units that generate large amounts of power, typically in the multi-Megawatt range.  The majority of the electricity generated by an SSEG should be consumed directly on site. There shall be times when generation exceeds consumption and typically a limited amount of power is allowed to flow in reverse - from the customer into the municipal electrical grid.  A SSEG customer therefore generates electricity on the customer’s side of the municipal electricity meter. | | |

# Glossary & Definitions

|  |  |
| --- | --- |
| **Alternating current** | The flow of electrical energy that follows a sine wave and changes direction at a fixed frequency (i.e. it ‘alternates’). Most residential and commercial uses of electricity require alternating current. |
| **Direct Current** | The flow of electrical energy in one constant direction. Direct current is typically converted to alternating current for practical purposes as most modern uses of electricity require alternating current. |
| **Anti-Islanding** | The ability of an SSEG installation to instantly and automatically disconnect the generator from the municipal electrical grid whenever there is a power outage in the utility municipal electrical grid, thus preventing the export of electricity to the municipal electrical grid from the SSEG. This is done primarily to protect municipal electrical grid workers who may be working on the grid and who may be unaware that the grid is still being energized by the SSEG. |
| **Bi-directional meter** | A meter that separately measures electricity flow in both directions (import and export) |
| **Cogeneration** | The sequential or simultaneous generation of multiple forms of useful energy (usually mechanical and thermal) in a single, integrated system. |
| **Customer** | In the context of this document, customers who also generate shall be referred to as “customers”, although in effect they are “customer/generators”. |
| **Generating capacity** | The maximum amount of electricity, measured in kilovolt Amperes (kVA), which can flow out of the generation equipment into the customer’s alternating current wiring system. This is therefore the maximum alternating current power flow which can be generated. |
| **Grid-tied** | An SSEG that is connected to the municipal electrical grid either directly or through a customer’s internal wiring is said to be “grid-tied”. The export of energy onto the municipal electrical grid is possible when generation exceeds consumption at any point in time. |
| **Inverter** | A power device that converts direct current to alternating current at a voltage and frequency which enables the generator to be connected to the municipal electrical grid. |
| **Isolated** | A section of an municipal electrical grid which is disconnected from all other possible sources of electrical potential is said to be isolated |
| **Load profile** | The variation of the customers rate of electricity consumption (or demand) over time. |
| **Low-voltage** | Voltage levels up to and including 1 kV. (1kV= 1000 Volts) |
| **Medium-voltage** | Voltage levels greater than 1 kV up to and including 35 kV. |
| **Net customer** | A net customer is someone who purchases (imports) more kWh of electricity than they export (sell) it over any 12 month period. |
| **Pr Eng or Pr Tech Eng or Pr Techni Eng** | This refers to a professional engineer, professional technologist or professional engineering technician who is registered with the Engineering Council of South Africa (ECSA). |
| **Reverse power flow** | The flow of energy from the customer electricity installation onto the municipal electrical grid (i.e. export) as a result of the instantaneous generation exceeding the instantaneous consumption at the generation site in question. |
| **Reverse power flow blocking** | A device which prevents power flowing from an embedded generator back onto the municipal electrical grid. |
| **Small Scale embedded generator** | A small-scale embedded generator for the purposes of these guidelines is an embedded generator with a generation capacity of less than 1000 kW (1MW). |
| **Stand-alone generator/ off-grid generator** | A generator that is not in any way connected to the municipal electrical grid. Export of energy onto the municipal electrical grid by the generator is therefore not possible. |
|  |  |

# Abbreviations

|  |  |
| --- | --- |
| **AMI** | Advanced Metering Infrastructure |
| **ECSA** | Engineering Council of South Africa |
| **kVA** | kilovolt-ampere (unit of apparent electrical power, often similar in magnitude to kW) |
| **kW** | kilowatt (unit of electrical power) |
| **kWp** | kilowatt peak (the rated peak output of solar PV panels) |
| **LV** | Low Voltage |
| **MV** | Medium Voltage |
| **MVA** | Megavolt Amperes (1000 kVA) |
| **NERSA** | National Energy Regulator of South Africa |
| **NMD** | Notified Maximum Demand |
| **PV** | Photovoltaic |
| **SSEG** | Small Scale Embedded Generation/Generator |
| **VAT** | Value Added Tax |
|  |  |
|  |  |

# Introduction

Since the Sustainable Energy Strategy for the Western Cape was developed in 2007, drastic changes have taken place. In early 2008, South African citizens began to experience planned interruptions of their electricity service (load shedding) as a result of South Africa’s electricity demand exceeding the available supply. In addition, global and national commitments to carbon mitigation have been made. Disruptive pricing of technologies (especially renewable energy) and energy sources (local electricity, global gas) has become a reality. Essentially, a number of major energy decisions are currently being made at national level – e.g. on gas, biofuels, independent power producers etc..

Together, these shifts in the energy landscape have accelerated the growing interest in the viability of Small Scale Embedded Generation (SSEG) in South Africa. This, in combination with the geographical location of the Western Cape in terms of the South African energy system, presents significant opportunities. The Western Cape Government and local municipalities have a chance to play a proactive role in the shifting energy landscape – contributing to a national solution to the energy crisis while boosting the local economy.

By encouraging growing interest in SSEG (like Photovoltaic Solar Systems (PV)), the Western Cape (and South Africa) can begin the shift towards a low-carbon urban energy environment. The large-scale uptake within municipalities of smart grids infrastructure, and embedded generation integrated into such infrastructure, would present new opportunities for economic growth, job creation, improving the efficiency of electricity provision, enhanced grid stability, mobilisation of investment, a reduction in greenhouse gas emissions and customer satisfaction.

The South African energy landscape is in a transitory phase between legacy/traditional infrastructure and a two-way or multi-party transactive energy future. What is required in this time of transition, are forward-thinking policies and rules and regulations that nurture the evolving distributed energy resource sector, while still allowing current systems to fulfil their role. Embedded generation is a local matter; municipalities play a critical role in creating the required infrastructure and facilitating the necessary regulatory environment to enable the establishment and growth of the SSEG field.

These Guidelines are designed to assist all relevant stakeholders involved in the installation, management and ownership of SSEG systems, where those systems have generation capacity of less than 1 MW (1000 kW)[[1]](#footnote-1) and feed electricity into the municipal electrical grid. It is written for the following stakeholders:

* SSEG project developers
* Residential and commercial property owners
* SSEG installers
* Energy consultants commissioned to design SSEG systems
* Municipal officials involved in SSEG generation
* Registered professional engineers, professional technologists or professional engineering technicians who are involved in SSEG commissioning

The document is broken down into four main sections (in addition to this introduction):

[Section one](#_Indemnity,_Legal_Requirements) details legal requirements and rights that the Municipality has in terms of SSEG.

[Section two](#_General_Guidelines_-) covers important considerations in terms of the Municipality’s SSEG rules and regulations that apply for all customers including residential, commercial and industrial customers.

Sections [three](#_Residential_Guideline_-) and [four](#_Commercial_and_Industrial) detail specific considerations for residential and commercial and industrial customers, respectively.

# Indemnity, Legal Requirements & Curtailment

## Illegal Connections to the municipal electrical grid

Paragraph \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the Electricity Supply By-law states that no generation equipment may be connected to the municipal electrical grid without the express consent of the Manager of the Electricity Services Department.

Failure to obtain this consent constitutes an offence which could lead to a fine and/or imprisonment.

Furthermore, the installation may also be in contravention of the Occupational Health and Safety Act, for which punitive sanctions also apply.

Customers found to have illegally connected SSEG equipment to the municipal electrical grid (either before or after their electricity meter) shall be instructed to have the installation disconnected from the municipal electrical grid. A Certificate of Compliance issued by a registered electrical contractor shall be required as proof of such disconnection.

Should the customer fail to have the SSEG disconnected from the municipal electrical grid, the Municipal Electricity Services Department shall disconnect the electricity supply to the property (as provisioned for in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Electricity Supply By-law)

Customers wishing to connect SSEG equipment legally to the municipal electrical grid shall be required to follow the normal application procedure as detailed in these Guidelines. No exemption from any of the Municipality’s requirements shall be granted for “retrospective applications”.

In addition, customers wishing to connect SSEG legally to the municipal electrical grid shall be required to ensure that illegal wiring forming part of the electrical installation is disconnected and that the installation is safe.

## Generation Curtailment

In the event of operating conditions resulting in municipal electrical grid parameters not meeting statutory minimum quality-of-supply standards, it may become necessary to impose peak generation limits on SSEG installations. It is expected that these limitations would be of a temporary nature, applied only during abnormal system conditions or low load periods.

## Right to adapt rules & regulations

In the event of provincial or national changes in the energy landscape, and in relevant rules, regulations, policies, laws and standards, it may become necessary to implement changes to this Guideline and the rules, regulations, bylaws and policies that it references.

## Right to deny access

It is essential that all customers wishing to install an SSEG system, regardless of generation capacity, complete the relevant sections of the application process in full, and that written approval is received from the Municipality, before the system is installed.

The Municipality needs to ensure that, among other considerations, the SSEG installation can be accommodated on the municipal electrical grid and that the total SSEG capacity of the municipal electrical grid has not been exceeded. Equipment should not be purchased prior to obtaining written approval from the Municipality as approval is not guaranteed and the Municipality shall not be held liable for equipment expenses where approval is denied.

# General guidelines for small scale embedded generators

Although the SSEG rules and regulations for residential and commercial and industrial customers are different, certain sections of the Municipality’s rules and regulations are overarching. This section covers important considerations in terms of the Municipality’s SSEG rules and regulations that apply to all customers – including residential, commercial and industrial customers who wish to connect an SSEG system with generation capacity smaller than 1 MW (1000 kW)[[2]](#footnote-2) to the municipal electrical grid.

## Registered professional sign off

Until SANS 10142-Part 3: *The Wiring of Premises* *– Embedded Generators* and SANS 10142-Part 4: *The Wiring of Premises – Direct Current and PV* are published, all SSEG projects shall be signed off by a registered professional engineer and a certificate of compliance shall be issued.

## Testing of inverters

Until such time as an SABS mark is issued for inverters, the Municipality shall require proof in the form of test certificates of type tests having been successfully carried out by a third party testing authority. The test certificates should certify compliance of inverters with the requirements of the Municipality and of NRS097-2-2.

## All generators shall be nett customers

All SSEG installations shall consume more energy than they produce in a consecutive 12-month period. This stipulation is in response to the National Energy Regulator of South Africa (NERSA) requiring customers that produce more energy than they consume on a consecutive 12-month period to have a NERSA generation license.

## Generating licence

Existing legislation requires that anyone generating electricity “not for own use” shall obtain a generating license from the National Energy Regulator of South Africa. A 1 MW SSEG installation feeding back into the municipal electrical grid, while continuing to purchase more energy from the municipality than it feeds back into the grid in a consecutive 12-month period, is classified as electricity generation “for own use” and does not require a generating license from the NERSA[[3]](#footnote-3).

If a NERSA generation licence is required, then it is the customer’s responsibility to interact with NERSA. The Municipality is obliged to report to NERSA on a regular basis regarding all municipal electrical grid connected generation and disconnect generators who are not adhering to regulations.

## Eskom grid connection

Customers residing within municipal boundaries, but located in Eskom’s area of supply, need to apply to Eskom for approval to connect SSEG equipment to the Eskom electrical grid.

## Decommissioning of an SSEG system and transfer/change of ownership

The Municipality requires notice of any SSEG system which has been decommissioned. The system shall be removed at the owner’s cost and a decommissioning report filed. If transfer/change of ownership takes place, a new certificate of compliance is required and a new Supplemental Contract shall be signed; alternatively, the SSEG system shall be decommissioned.

## Islanding / Anti-islanding installations

Grid-tied inverters are generally not designed to operate in “islanded mode” where the SSEG installation supplies power to a portion of the customer’s electrical grid during a general power outage. Should the inverter have this facility, it shall be effectively isolated from the municipal electrical grid during operation (as is legally required of any standby generator).

If the SSEG installation is to be configured as a standby supply after islanding from the municipal electrical grid, the SSEG installation shall be connected to the existing internal wiring of the property. A registered person in terms of the Electrical Installation Regulations (2009) shall install the generator and issue a Certificate of Compliance to the owner if the generator is to be connected to the existing internal wiring of the property. Requirements of SANS 10142-1 – Clause 7.12 (Alternative supplies, including low voltage generating sets, Installations, etc.) apply. A fire safety and emergency shut off switch shall be installed where the SSEG installation is to be configured as a standby supply after islanding.

## Off-grid system

Standalone generators (not connected to the municipal electrical grid in anyway) do not need permission from the electricity department. However, approvals from other departments are still necessary (health, building). If the SSEG system shall never be grid-tied to an electrical installation connected to the municipal electrical grid, a registered person in terms of the Electrical Installation Regulations (2009) shall install the SSEG system and issue a Certificate of Compliance issued to the owner in terms of South African National Standard - The wiring of premises (SANS 10142-1 – Low-voltage installations), which confirms that the SSEG system is not grid-tied to the municipal electrical grid and that it only supplies an off-grid electrical installation. The Municipality shall require a copy of the Certificate of Compliance.

## Break-before-make switch with an appropriate change-over switch interlock

Approval by the Municipal’s Electricity Services Department is not required if the SSEG installation is connected to the customer’s electrical grid via a break-before-make switch with an appropriate change-over switch interlock.

## Adaption of electrical installation

All customers wishing to participate in the SSEG tariff shall adapt their electrical installations in such a way that metering is accommodated in a meter kiosk in the road reserve. This does not apply where an acceptable meter box or meter room already exists on the street-front property boundary. If no kiosk exists or there is no room for the meter in an existing kiosk, a meter kiosk shall be installed in the road reserve at the Municipality’s cost. Only in cases where there are extremely narrow or no footways, thereby precluding the installation of a meter kiosk, shall customers be required to provide metering accommodation on the street-front property boundary. Such a meter box shall face outwards and be locked with a standard Electricity Services Department lock.

Refund of Prepayment meter (PPM) units when a customer changes to the SSEG tariff and has an AMI (credit) meter installed:

* PPM vending unit tokens already loaded on the PPM:
  + The customer may delay the installation of an AMI meter.
  + Alternatively the customer may elect to forfeit the units on the PPM.
* PPM vending unit tokens not yet loaded onto the meter
  + The customer may request a refund. The token shall be validated to confirm that it has not been used after which the customer shall be refunded at the original tariff rate at which the token was purchased. The refund shall be credited to the customer’s municipal account and shall not be paid out in cash.

## Load profile management

The SSEG tariff has been structured in such a way that customers shall find it most beneficial, from a financial and practical point of view, to ensure that they utilise as much of the generated electricity as they can and avoid or minimise reverse power flow.

Figure 1: Load profile management - alignment between load profile and SSEG (PV) generation.

Figure 2: Load profile management - Misalignment between load profile and SSEG (PV) generation.

## Grid studies

Should the generation site not meet the criteria for a simplified utility connection for a low-voltage (LV) connected SSEG system in terms of NRS 097-2-3, a municipal electrical grid study may be necessary and shall be carried out at the applicant’s cost.

## Applicable technical standards

Most of the technical requirements for SSEG are covered in the following standards and guidelines (note that these do not necessarily cover all requirements for small scale embedded generation):

1. NRS 097-2: *Grid interconnection of embedded generation: Part 2 SSEG*
2. *South African Renewable Power Plant Grid Code*

## Additional applications to be considered

### Planning and building development management

No building plans are required to be submitted, provided the SSEG installation does not project more than 1.5 m (measured perpendicularly) above the roof and/or not more than 600 mm above the highest point of the roof. If the above statement does not apply then full building plans, including an engineer’s endorsement, are required. A relaxation in terms of the Zoning Scheme Regulations is also required under either one or both of the above circumstances[[4]](#footnote-4).

### Health and Air Quality Approvals

The Air Quality and Mechanical Engineering (Noise) Units do not need to be consulted with SSEG applications where diesel-fuelled mechanical engine generators are not part of the installation. Should a mechanical engine (which burns fuel or generates noise) be incorporated in the installation, such applications should be referred to the municipality’s health department.

### Environmental approvals

A residential SSEG installation does not require environmental approval unless it exceeds the electricity generation threshold mentioned in the section pertaining to *Planning and Building Development Management[[5]](#footnote-5).*

## Who pays for what?

The customer is responsible for paying for the following:

* The supply and installation of meters.
* Specialist municipal electrical grid studies (if required).
* Any changes needed to the municipal electrical grid, upstream of the connection point as a result of the SSEG installation (subject to the clause mentioned in section 3.10).
* Specialist testing that are required, e.g. inverter testing.

# Residential guidelines for small scale embedded generators

## Generation size limitations

The following SSEG size limitations are derived from NRS 097-2-3 for shared LV connections.

Table 1: SSEG size limitations - NRS 097-2-3 for Shared LV connections

|  |  |  |
| --- | --- | --- |
| **Service connection** | |  |
| **No. of Phases** | **Service Circuit Breaker Size (A)** | **Maximum Total Generation Capacity of SSEG (kVA)** |
| 1 | 40 | 2.3 (10A) |
| 1 | 60 | 3.5 (15A) |
| 1 | 80 | 4.6 (20A) |
| 3 | 40 | 6.9 (30A) |
| 3 | 60 | 10.4 (45A) |
| 3 | 80 | 13.9 (60A) |
| 3 | 100 | 17.3 (75A) |

The generation size limits in the table apply to normal residential connections on a shared LV network. Customers who wish to apply for an installation with a generation capacity exceeding the limits in the above table, should consult with the Electricity Services Department before commencing. If SSEG generation capacity is 4.6 kVA or less, a single-phase inverter can be installed, even if the customer has a three-phase connection. However, it is the responsibility of the customer to ensure that their load is balanced across all three phases. A registered professional should be consulted.

## Metering

### Municipal electrical grid connection with reverse power flow blocking protection

Customers wanting to connect an SSEG system to the municipal electrical grid without being compensated for reverse power flow, shall be required to install reverse power flow blocking protection to prevent reverse power flow into the municipal electrical grid. If reverse power flow blocking protection is installed, the applicant can remain on their current tariff and continue to use their current meter.

### Municipal electrical grid connection with reverse power flow/ feed-in to the municipal electrical grid

Residential customers installing SSEG who wish to participate in the SSEG tariff shall have a bi-directional SSEG approved meter. The Municipality shall provide and install the requisite meters at the customer’s cost. Conventional credit or prepayment meters are not allowed to run backwards. If, for some reason, the customer is moved off the SSEG tariff (either by their own doing or by municipal mandate) they shall be required, at their own cost, to install reverse power flow blocking protection and (if necessary) a prepayment meter. They shall also forfeit any expenditure incurred purchasing the bi-directional SSEG-approved meter.

## Small scale embedded generation tariff

In order to qualify for the SSEG tariff customers shall have excess generation to regularly require the facility to feed excess power back onto the municipal electrical grid. It shall be at the Electricity Services Department’s discretion to decide whether customers shall be allowed on the residential SSEG tariff. Customers shall be moved off the tariff if they do not have sufficient regular excess generation capacity.

The applicable SSEG tariff is the Residential small-scale embedded generation tariff and comprises of:

* A daily service & network charge
* Electricity consumption charges for kWh consumed
* A rate per kWh at which the Municipality shall purchase residential excess generation

### Network cost (R/kVA – based on capacity)

It shall be ensured that the fixed costs associated with maintaining and operating the municipal electrical grid are recovered through appropriate charges. In the long term, these fixed costs may even increase due to SSEG as the municipal electrical grid needs to manage bi-directional flow.

### Service charge

It shall be ensured that the fixed costs associated with providing a retail service network (metering, billing, customer call centre) are recovered through appropriate fixed charges.

### Energy charge (c/kWh)

It shall be ensured that the variable cost associated with the volume of energy consumed is recovered through appropriate charges. This is billed on a per kWh basis and may be simple (Flat or Inclining Block Tariff) or complex (Time of Use or other).

### Feed-in rate (c/kWh)

The SSEG system may avoid certain costs for a distributor and the customer should be fully compensated through an export credit rate for any measurable reduction of cost to the utility (energy cost/purchases and the network and line losses costs).

### Billing Period

The daily service charge along with charges for consumption and credits for feed-in shall be billed monthly (as is done for other Municipal services e.g. water and rates). Tariffs are determined annually by the Municipality and are subject to approval by NERSA. SSEG applicants should check the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Municipality’s website for the latest tariffs.

### Increased Costs

The Municipality bares no responsibility should the customer’s electricity bill increase due to changes in the tariff structure. It is up to the customer to ensure that they understand the financial implications of having an SSEG system installed.

### Example Tariff

The following tariff was developed by the City of Cape Town.

Table 2: Example 2015/16 Municipality Tariff

|  |  |
| --- | --- |
| **Domestic Embedded Generation Tariff** | |
| **Daily (service/network) charge** | R13.03 |
| **Energy 0-600kWh** | R1.09 |
| **Energy 600kWh +** | R2.14 |
| **Feedback** | 57c (VAT Excluded) |

# Commercial and industrial guidelines for small scale embedded generators

## Generation size limitations

This guideline does not cover systems over 1 MW (1000 kW).

All LV commercial and industrial customers planning to install SSEG systems under 1 MW should comply with the sizing limitations specified in NRS 097-2-3.

Medium Voltage (MV) commercial and industrial customers planning to install SSEG systems under 1 MW may require a bespoke engineering study to determine the impact of the proposed SSEG system size on the municipal electrical grid.

## Metering

### Municipal electrical grid connection with reverse power flow blocking protection

Customers who want to connect SSEG systems to the municipal electrical grid without being compensated for reverse power flow, shall be required to install reverse power flow blocking protection to prevent reverse power flow onto the municipal electrical grid. If reverse power flow blocking protection is installed, the applicant can remain on their current tariff and continue to use their current meter.

### Municipal electrical grid connection with reverse power flow/ feed-in to the municipal electrical grid

Customers installing SSEG who wish to participate in the SSEG tariff shall have a bi-directional SSEG approved meter. The Municipality shall provide and install the requisite meters at the customer’s cost. Conventional credit or prepayment meters are not allowed to run backwards. If, for some reason, the customer is moved off the SSEG tariff (either by their own doing or by municipal mandate) they shall be required, at their own cost, to install reverse power flow blocking protection and (if necessary) a prepayment meter. They shall also forfeit any expenditure incurred purchasing the bi-directional SSEG approved meter.

## Embedded generation tariff

Commercial and industrial customers who are on tariffs that have a daily service charge shall see no difference to the tariff, other than the addition of a generation credit component – simply a reimbursement for energy exported into the municipal electrical grid. Customers on a tariff that does *not* include a daily service charge, shall be changed to an appropriate tariff. Tariffs are determined annually by the Municipality and are subject to approval by NERSA. SSEG applicants should check the Municipality’s website for the latest tariffs.

# Application process for residential, commercial and industrial small scale embedded generation

The *application for the connection of embedded generation* form should be completed for all forms of embedded electricity generation, including renewable energy and cogeneration. This form deals with applications for approval of all SSEG installations. Should tariff or metering changes be required for the SSEG installation, the general application form for new or modified connections should also be completed. The forms are available on the Municipality’s website.

* **Step 1: Visit the Municipality website**
  + Visit the Municipality’s website and download the relevant application form/s.
* **Step 2: Complete *application for the connection of small scale embedded generation* form and, if required, the general application form for new or modified connections**
  + The Municipality requires that the application form/s be signed by the property owner.
  + Details of the proposed installer should also be provided.
  + The property owner may need support from the proposed installer or a registered professional in order to complete the *generation and embedded generation application form*.
* **Step 3: Obtain permission from other municipal departments**
  + The Electricity Services Department shall require prior approval of the proposed SSEG installation from other municipal departments, such as Planning and Building Development management, Municipal Health and other specialised services.
* **Step 4: Submit completed application form/s and attachments**
  + Form/s should be submitted to the relevant Electricity Service Department.
* **Step 5: Installation commencement upon approval from the Municipality and signing of the Supplemental contract for embedded generation (Supplemental to the contract for the supply of electricity).**
  + After due consideration of the application, the applicant shall be informed in writing whether their application has been successful.
  + Once notified of a successful application, the applicant may commence installation.
  + Applicants whose applications were not approved may modify and resubmit applications.
* **Step 6: Commissioning information and documentation to be submitted to the Electricity Services Department (a division within the Municipality).**
  + Commissioning of the system should be undertaken by a registered professional, who should complete and sign off the *SSEG Installation Commissioning Report*.
  + In addition to the Commissioning Report, the following documentation should also be completed:
    - Final copy of circuit diagram.
    - Inverter Type Test - The inverter type test certification requirements are specified in the NRS 097-2-1. Type testing is to be undertaken by a 3rd party test house such as Bureau Veritas, KEMA or TÜV Rheinland. Inverter suppliers should be asked to provide the necessary certification before the equipment is purchased. A list of inverters which have been shown to comply with municipal requirements can be found on the municipality’s website.
    - Factory setting sheet or other documentation showing that the inverter has been set according to NRS 097-2-1.
    - An electrical installation certificate of compliance as per SANS 10142-1.
    - A signed *Supplemental Contract for Embedded Generation*. This is a legally-required contract that governs the relationship between the Municipality and the customer. The contract is valid for as long as the project is in existence.
    - Operation and Maintenance Procedure – installation responsibilities after commissioning.
    - All completed documentation shall be submitted to the relevant Electricity Services office.
* **Step 7: Inspection of installation if necessary**
  + The Municipality shall inspect the installation if required, although this is unlikely in the case of a residential application.
* **Step 8: Approval granted to connect to the municipal electrical grid and generation commences**
  + If all of the above is satisfactory, the Municipality shall install the necessary meters.
  + Approval to connect SSEG to the municipal electrical grid shall be provided by the Electricity Services Department to the customer, in writing, together with any operation and decommissioning requirements deemed necessary.
  + Once this is done, the change to the tariff shall be implemented where applicable.
* **Step 9: Repeat the process in the case of SSEG capacity expansion**
  + Should an expansion or a change to the system be required, a new application should be completed.

# Annexure A - Supplemental contract for embedded generation

Municipal graphics

Municipal graphics

**SUPPLEMENTAL CONTRACT FOR SMALL SCALE EMBEDDED GENERATION (SSEG)**

(Supplemental to the contract for the supply of electricity)

Made and entered into between -

**THE MUNICIPALITY OF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

(hereinafter referred to as the **“Municipality”**)

and

**.................................................................**

(hereinafter referred to as the **“customer”**)

WHEREAS the customer has applied to the Municipality for the connection of an embedded generator and the Municipality is prepared to approve the connection in accordance with the terms and conditions of this contract;

AND WHEREAS the Municipality and the customers are desirous of entering into a written contract recording and regulating the terms and conditions relating to the connection of the embedded generator;

NOW THEREFORE THE PARTIES HERETO HAVE AGREED EACH WITH THE OTHER:

1. **DEFINITIONS**

In this contract the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires:

1.1 “Anti-Islanding” shall mean the ability of an embedded generation system to instantly and automatically disconnect the generator from connection to the municipal electrical grid, whenever the local municipal electrical grid has lost the supply of power from the national electricity grid, thus preventing the export of electricity to the municipal electrical grid from the embedded generator. This is done primarily to protect municipal workers who may be working on the municipal electrical grid and who may be unaware that the municipal electrical grid is still being energized by the embedded generator.

1.2 “MUNICIPALITY” shall mean The Municipality of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, established in terms of the Local Government: Municipal Structures Act, 1998 read with the Western Cape Provincial Notice No. 479/2000 published in Province of the Western Cape: Provincial Gazette 5588 dated 22 September 2000.

1.3 “Customer” shall mean: (individual/company name)

………………………………………………………………………………………………………………………

Company/close corporation registration number (if applicable) ……………………………………

1.4 “Contract” shall mean this contract together with the Schedules and Annexures hereto.

1.5 “Effective date’’ shall mean the first business day following the date of signature by the customer, provided that connection to the municipal electrical grid shall only be permitted as provided in terms of this contract.

1.6 “Electrical installation” shall mean any machinery, in or on any premises, used for the transmission of electricity from a point of control to a point of consumption anywhere on the premises, including any article forming part of such an electrical installation irrespective of whether or not it is part of the electrical circuit.

1.7 “Embedded generator” shall mean an electricity generating device, such as a photovoltaic panel or wind turbine that is connected to the customer’s electrical installation beyond the point of control.

1.8 “Energy import” shall mean the energy flowing from the municipal electrical grid into the customer’s electrical installation.

1.9 “Energy export” shall mean the energy flowing from the customer’s electrical installation back into the municipal electrical grid.

1.10 “Kilowatt hour” shall mean the consumption or generation of electrical energy equivalent to one kilowatt of power sustained for one hour.

1.11 “Law” shall mean the provisions of the Local Government: Municipal Systems Act (Act No. 32 of 2000), the Electricity Regulation Act, (Act No. 4 of 2006), the Municipality of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ By-law, as well as any applicable law, proclamation, ordinance, act of parliament or other enactment having force of law.

1.12 “Main supply contract’ shall mean the existing contract in place between the Municipality and the customer for the supply of electrical power at the premises, as contained in the documentation signed at the time of applying for an electrical connection, read together with the Municipality of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Electricity By-Law.

1.13 “Month” shall mean the period between successive monthly meter readings made in terms of this contract, irrespective of whether such readings are taken on the last day of the calendar month; provided that if, in terms of this contract, meter readings may be estimated should the actual reading of the meter not be possible in any particular month.

1.14 “Net consumer” shall mean a customer who, over a period of a year, imports (purchases) more energy than s/he exports (feeds back into the municipal electrical grid).

1.15 “Point of control” shall mean the point at which an electrical installation on or in any premises can be switched off by a user or lessor from the electricity supplied from the point of supply.

1.16 “Parties” shall mean the Municipality and the customer.

1.17 “Point of supply” shall mean the actual supply point on the municipal electrical grid as described in Schedule 1.

1.18 “Prescribed tariff” shall mean the approved Municipality’s tariff of charges for electricity and services, as amended from time to time.

1.19 “Rated generator capacity” shall mean the maximum output of the embedded generator as advised by the customer to the Municipality; being the sum of the outputs, in kVA, of all invertors connected to embedded generators and the customer’s installation.

1. **INTERPRETATION**
   1. Unless inconsistent with the context, an expression which denotes:

2.1.1 any gender includes the other genders;

2.1.2 a natural person includes a juristic person and vice versa;

2.1.3 the singular includes the plural and vice versa.

2.2 The headings of the clauses of this contract shall not be deemed part of or affect the interpretation or construction thereof.

2.3 If any provision in a definition is a substantive provision conferring rights or imposing obligations on any party, notwithstanding that it only appears in a definitions clause, effect shall be given to it as if it were a substantive provision in the body of this contract.

1. **CONNECTION OF EMBEDDED GENERATOR**

The Municipality undertakes to approve the connection of an embedded generator, as described in Schedule 1 to this agreement, by the customer at the premises, subject to the terms and conditions of this contract. The customer may only, other than for the purposes of carrying out tests and commissioning), connect their SSEG installation to the municipal electrical grid upon receipt of a written letter from the Director: Electricity Services giving consent for such connection.

1. **PERIOD OF CONTRACT**

This contract shall commence on the effective date and shall continue indefinitely unless terminated by either party, in terms of Clause 21 of this contract.

1. **CESSION**

The customer shall not cede or assign this contract or any part thereof or any benefit, obligation or interest herein or hereunder without the prior written consent of the Municipality.

1. **CURTAILMENT OF GENERATION**

The customer shall, if and when required and on instruction by the Municipality, reduce peak generation during abnormal system conditions or low load periods.

**7. DISCONTINUANCE OF MUNICIPAL ELECTRICAL GRID CONNECTED GENERATION**

An embedded generator which has been decommissioned, must be physically disconnected from the municipal electrical grid by the removal of all wiring that connects the inverter/s with the municipal electrical grid.

Municipal electrical grid connected generation shall only be considered by the Municipality as being disconnected from the municipal electrical grid once the customer has notified the Municipality of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in writing on the prescribed form and provided the Municipality with a copy of the Certificate of Compliance covering the removal of the wiring.

1. **NOTIFIED MAXIMUM EMBEDDED GENERATOR OUTPUT**

7.1 The notified maximum output of the embedded generator is as specified in Schedule

7.2 If the customer proposes increasing the maximum output of the embedded generator, he/she/it shall not implement such increase without the consent of the Municipality, which shall not be granted to the customer until: -

7.2.1 the customer has submitted an additional embedded generator application for an upgrade of an existing system to the Municipality; and

7.2.2 The parties enter into a new contract; and

7.2.3 any work required on the parties’ electricity networks have been completed, to the satisfaction of the Municipality.

1. **NET CONSUMER**

8.1 Consent to the connection of an embedded generator is given subject to:

8.1.1 the condition that the customer remain a net consumer of electricity over a rolling period of twelve months:

8.1.2 the condition that the embedded generator shall not exceed the maximum generator output figure stipulated in Schedule 1.

8.2 Should the customer not remain a net consumer he/she/it shall be deemed to be in breach of this Contract in terms of section 20.

1. **RESIDENTIAL CUSTOMERS**

9.1 A residential customer shall only be entitled to the benefit of being charged the small scale embedded generation tariff if he/she/it has a bona fide need to feed power back into the municipal electrical grid each month. Should this not be the case the Director, Electricity Services may require that the customer either withdraw the embedded generator from service or alternatively have a prepayment meter and reverse power flow blocking protection installed, so as to place the customer on the appropriate domestic consumption tariff.

9.2 All costs for metering changes shall be for the customer’s account.

1. **PRICES FOR ELECTRICITY**
   1. The customer’s municipal account shall be credited for energy generated by the embedded generator and exported to the municipal electrical grid in the amount/s reflected in the Municipality’s annual tariff relating to the import and export of electrical energy for embedded generation.
   2. At the time that the customer ceases to be on the small scale embedded generation tariff, any remaining credit balance shall be refunded to the customer on written request provided that the customer has no other outstanding municipal debt.
   3. The aforesaid tariffs are amended annually on 1 July of each calendar year, as regards quantum and structure, and are applicable to all existing and new embedded generators. The Municipality reserves the right to make amendments to the tariff as stated and does not warrant the financial viability of the customer’s embedded generation installation.
   4. A schedule of the tariffs set by the Municipality shall be furnished to the customer upon written request to the Municipality.
   5. The Municipality shall not be obliged to grant credit to the customer for power not received onto the municipal electrical grid due to unavailability of the municipal electrical grid or for any other reason.
2. **SUPPLY TO THIRD PARTY PROHIBITED**

The customer shall not supply any electricity generated on the premises under this contract to any third party on any other premises in any way.

1. **TRANSFER OF SUPPLY TO ANOTHER SUPPLY AUTHORITY**

The parties agree that, if the premises of the customer in the future become located within the area of jurisdiction of another supply authority, this Supplemental Contract shall be terminated and the customer may negotiate with the new supply authority a new Contract for embedded generation.

1. **COMPLIANCE WITH THE MUNICIPALITY’S TECHNICAL REQUIREMENTS**

13.1 It is an express condition of this contract that the customer ensure that the SSEG equipment remains compliant with the Municipality’s technical requirements and if it does not do so the customer shall be in breach of this contract.

13.2 The Municipality reserves the right to (not unreasonably) alter its requirements for whatsoever reason and the customer shall be obliged to ensure at the customer’s cost that the SSEG equipment complies with the additional requirements.

1. **QUALITY OF SUPPLY**

14.1 In accordance with the Electricity Regulation Act, as amended, the customer shall be responsible for maintaining the quality of supply from the embedded generator within the limits set out in the NRS 048 Quality of Supply and NRS 097 Grid Interconnection of Embedded Generation specification, with which the customer acknowledges himself/herself/itself to be acquainted.

14.2 The Municipality shall not be liable for any loss or damage, direct or consequential, suffered or sustained by a customer as a result of or arising from the cessation, interruption or any other abnormality of the supply of electricity, unless caused by negligence on the part of the Municipality.

1. **MUNICIPAL ELECTRICAL GRID STABILITY**

The customer shall ensure that the anti-islanding functionality of the generation equipment is in good operational order to ensure the safety of the Municipality’s personnel.

1. **MEASUREMENT OF IMPORT AND EXPORT OF ENERGY**

Measurement of imported and exported energy shall be carried out monthly.

1. **BILLING AND PAYMENT OF CHARGES**

The customer shall be liable for all charges as per the Municipality’s Electricity Tariff as amended from time to time.

Customers who have had a bidirectional AMI credit meter installed and are on a small scale embedded generation tariff shall be billed as follows:

17.1 The daily service charge and all energy and maximum demand charges, as applicable, shall be billed on the monthly electricity account.

17.2 Compensation for export of energy shall be carried out monthly against the normal monthly electricity account.

17.3 Customers shall not be paid out if the monthly bill goes into credit - the credit balance shall be carried forward to the following month.

17.4 VAT shall only be payable by the Municipality on exported energy where the customer is registered with the South African Revenue Service (SARS) as a VAT vendor.

1. **GENERATION LICENCE**

The Electricity Regulation Act stipulates that municipal electrical grid connected generators shall obtain a generating licence. “Generating for own use” is excluded from this requirement. It is recorded that clarification is still required from the National Energy Regulator of South Africa whether generators who are net customers are considered to be “generating for own use”. The customer bears all the risk regarding any liability which might arise from any change or clarification made by NERSA in this regard, and specifically indemnifies the Municipality with regard to any such risk or liability.

1. **THE PARTIES’ OBSERVANCE OF APPLICABLE LEGISLATION**

The parties shall in addition to complying with the terms and conditions of this contract also comply with the provision of any law which may have application to this contract.

1. **BREACH**

20.1 Should either party hereto breach or fail to comply with any term or condition of this contract then the party aggrieved thereby shall give the defaulting party written notice to rectify such a breach.

20.2 In the event of the defaulting party failing to rectify such a breach within fourteen (14) days of the receipt of such notice, the aggrieved party shall be entitled to give written notice of termination of this contract to the other party. Such termination shall take effect upon receipt of such notice by the defaulting party.

20.3 Should either party repeatedly breach any of the terms and conditions of this contract in such a manner as to justify the aggrieved party in holding that the defaulting party’s conduct is inconsistent with the defaulting party’s intention to carry out the terms and conditions of this contract, then and in such event the aggrieved party shall without prejudice to its legal rights and remedies, be entitled to terminate this contract.

20.4 Termination of this contract shall be without prejudice to any other rights or remedies of the aggrieved party under this contract or at law and shall not affect any accrued rights or liabilities of the aggrieved party at the date of termination.

1. **TERMINATION**

This contract shall terminate with immediate effect upon the happening of any of the following events:

21.1 If either party fails to rectify a breach of this contract as provided for in terms of Clause 20.

21.2 If the customer gives two working days’ notice in writing of him/her decommissioning and disconnecting the embedded generator.

21.3 If the main supply contract is terminated.

21.4 If the parties mutually agree to terminate this contract.

1. **GENERAL CONDITIONS**

22.1 No alteration, cancellation, variation of or addition to this contract shall be of any force or effect unless reduced to writing and signed by the Municipality and the customer or their duly authorised representatives.

22.2 The schedules to this contract may be amended by an exchange of letters between the parties.

22.3 This Contract constitutes the entire supplemental contract between the parties hereto in relation to the municipal electrical grid connected embedded generator and neither of the parties shall be bound by any undertakings, representations, warranties, promises or the like not recorded herein.

22.4 No extension of time or other indulgence granted by either party to the other in respect of either of the parties’ obligations shall constitute a waiver of either of the parties’ right to enforce compliance with the terms of this contract; neither shall it constitute a novation of this contract.

22.5 The customer acknowledges that he/she/it is entering into this contract voluntarily and at his/her/its risk. Accordingly he/she/it grants a full and sufficient indemnity in favour of the Municipality against all risk or liability which may arise from the contract. This shall include any losses suffered by the customer arising from negligence relating to the design, construction, installation, commissioning, operation and maintenance of the embedded generator.

1. **DOMICILIUM CITANDI ET EXECUTANDI**

23.1 Each of the parties chooses domicilium citandi et executandi for the purposes of the giving of any notice, the serving of any legal process and for any purposes arising from this Contract at their respective addresses set forth hereunder:

**The MUNICIPALITY:** **The Customer:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

23.2 Any notice to any party shall be addressed to it at its domicilium aforesaid and be sent either by pre‑paid registered post or be delivered by hand. In the case of any notice:

23.2.1 Sent by pre‑paid registered post, it shall be deemed to have been received, unless the contrary is proved, on the seventh day after posting; and

23.2.2 Delivered by hand, it shall be deemed to have been received, unless the contrary is proved, on the date of delivery, provided such date is a business day or otherwise on the next following business day;

23.2.3 Any party shall be entitled by notice in writing to the other, to change its domicilium to any other address within the Republic of South Africa, provided that the change shall become effective only fourteen (14) days after the service of the notice in question;

23.2.4 Any notice addressed to the Municipality shall be required to be addressed to the Municipality Manager (for the Attention of the Director: Electricity Services) to be deemed to have been effectively delivered or served.

1. **JURISDICTION**

The parties hereby consent in terms of Section 45 of the Magistrate’s Court Act No 32 of 1944 as amended to the jurisdiction of the Magistrate’s Court of any district having jurisdiction in terms of Section 28 of the said Act, to adjudicate any dispute arising from this contract, provided that such consent shall not derogate from the right of either party to institute proceedings in the High Court.

1. **COSTS**

Each party shall bear his/her/its own costs incurred in the negotiation, preparation and settling of the terms of this contract.

1. **WARRANTY OF AUTHORITY**

Each party warrants to the other party that it has the power, authority and legal right to enter into, sign and perform in terms of this contract, and that this contract has been duly authorised by all necessary actions of its directors or person/s on whose behalf the signatory acts herein.

SIGNED AT......................................................THIS............ DAY OF..................……………….....20…….

**The Customer :**…………………………………………….

As Witnesses: 1: …………………………………………..

2:……………………………………………

SIGNED AT.....................................................THIS..............DAY OF.................……………......... 20…….

**The Municipality :**…………………………………………….

As Witnesses: 1: …………………………………………..

2:……………………………………………

**SUPPLEMENTAL CONTRACT FOR EMBEDDED GENERATION**

**SCHEDULE 1**

1. Details of premises:
   1. Erf no. …………………………… Suburb …………………………………………….…

* 1. Address ……………………………………………………………………………………..
  2. Name of building ………………………………………………….………………….….
  3. Meter position ……………………………………………………………………...……..

1. Customer category: Residential / Commercial / Industrial \*
2. Supply voltage ………………….V(±10%) Single / Three phase \*
3. Type of meter ……………………………………………………….
4. Rated generator capacity (AC side ) …………………………………..kVA
5. Notified maximum demand of the property ……………………….. kVA
6. Authorized capacity of the property ………………..……………….. kVA
7. The tariff rate applicable to this supply as per the schedule of tariffs of the MUNICIPALITY is:

Tariff description/s………………………………………………………………………….…..

1. Allow export of excess power onto municipal electrical grid - Yes / No\*
2. Special power quality requirements:

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

*\* Delete what is not applicable*

# Annexure B - Application for the connection of small scale embedded generation

Municipal graphic

Municipal graphic

**ELECTRICITY SERVICES**

|  |  |
| --- | --- |
| **APPLICATION FOR THE CONNECTION OF SMALL SCALE EMBEDDED GENERATION** |  |

This application form for the connection of small scale embedded generation is for small scale embedded generators to be installed by residential, commercial or industrial customers. It is applicable to all forms of embedded electricity generation, including renewable energy and cogeneration.

* A separate “Application for a new or modified electricity supply service” form must also be completed, except for installations where reverse power blocking is to be installed.
* If the embedded generator is to be configured as a standby supply after islanding from the municipal electrical grid, the generator shall have to be connected to the existing internal wiring of the property. In such a case, the property owner must obtain a certificate of compliance from a qualified electrician.

|  |  |  |  |
| --- | --- | --- | --- |
| **Submit completed form to:** | Customer Support Services: | | |
|  |  |  |
| **or** | Customer Support Services: | | |
|  |  |  |  |
| **or** | Customer Support Services: | | |
|  |  |  |  |

|  |  |
| --- | --- |
| **Property name and location:** | Project name: |
|  | Erf number: |
|  | Physical address: |
|  | Township / Suburb / Farm: |
|  | Postal code: |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name and account numbers of property owner:**  (Only if small scale embedded generation is to be connected with the Municipality of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electrical grid) | First name: |  | Last name: |  | | | Title: |  |
| Business partner number  as per municipal account: |  | | | Contract account number: |  | | |

**ELECTRICITY SERVICES**

|  |  |
| --- | --- |
| **APPLICATION FOR THE CONNECTION OF SMALL SCALE EMBEDDED GENERATION** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Property owner contact details:** |  | **Office** | **Mobile** |
|  | Telephone number |  |  |

|  |  |  |
| --- | --- | --- |
|  | Facsimile number |  |

|  |  |  |
| --- | --- | --- |
|  | E-mail  address |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **✓** |
| **Application type** | Residential |  | | | |
| (Tick appropriate boxes) | Commercial/Industrial |  | | | |
|  | New |  | | | |
|  | Revised application |  | | | |
|  | Upgrade existing system |  | | | |
|  | Change of property owner |  | | | |
|  | Other (specify) |  | | | |

|  |  |  |
| --- | --- | --- |
| **Planned construction schedule:** | Projected construction start date |  |
|  | Projected in-service date of embedded generator |  |

|  |  |  |
| --- | --- | --- |
|  | | **✓** |
| **Mode of small scale embedded generation :**  (Tick appropriate box) | Energy from small scale embedded generation to be used within a customer’s own electricity grid and no excess to be exported to municipal electrical grid. |  |

|  |  |  |
| --- | --- | --- |
|  | Energy from small scale embedded generation to be used within a customer’s electricity grid and excess to be exported to municipal electrical grid. |  |
|  |  |  |
|  | Energy from small scale embedded generation to be used solely for exporting to municipal electrical grid |  |

|  |
| --- |
|  |

|  |  |
| --- | --- |
| **Type of prime mover and fuel source for small scale embedded generation :** e.g. photo-voltaic, concentrated solar power, small hydro, landfill gas, biomass, biogas, wind, co-generation |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | **✓** |
| **Battery storage** | Yes |  | No |  |

(Tick appropriate box)

|  |  |
| --- | --- |
| kWh |  |

**ELECTRICITY SERVICES**

|  |  |
| --- | --- |
| **APPLICATION FOR THE CONNECTION OF SMALL SCALE EMBEDDED GENERATION** |  |

|  |  |  |
| --- | --- | --- |
| **Type of energy conversion:**  E.g. Synchronous generator, induction generator, inverter, fuel-cell, dyno set. (Include operating characteristics). |  | |
|  | |  |
|  | |  |
| **Site location:** | Latitude (dd mm sss) | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **S** |  |  | ° |  |  | ‘ |  |  |  | ‘’ | |
|  | Longitude (dd mm sss) | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **E** |  |  | ° |  |  | ‘ |  |  |  | ‘’ | |
|  | For commercial/industrial only (show location and dimensions of intended installation infrastructure in relation to the existing property point of connection and buildings.) |  |

|  |  |
| --- | --- |
| **Site land use zoning:** |  |

|  |  |  |
| --- | --- | --- |
| **Preliminary design[[6]](#footnote-6):**  (to be attached) | Circuit diagram and design showing major components, proposed point of common coupling, isolating and interfacing devices with municipal electrical grid, protection schemes, customer grid, operating characteristics, etc. |  |
|  |  |  |
|  | Earthing arrangements i.e. TN-C-S |  |

|  |  |
| --- | --- |
| **Total capacity of small scale embedded generation (kVA and PF[[7]](#footnote-7)):** (Attach schedule for each unit if more than one generation unit and location) |  |

|  |  |  |
| --- | --- | --- |
| **Property distribution board main circuit breaker size:** | Ampere (A) | Single- or three-phase |
|  |  |  |

**ELECTRICITY SERVICES**

|  |  |
| --- | --- |
| **APPLICATION FOR THE CONNECTION OF SMALL SCALE EMBEDDED GENERATION** |  |

**Proposed consumption and generation levels:**

(Complete the table below)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Month | Estimated imported energy for the month  (kWh) (Electricity bought from utility once SSEG is installed) | Estimated exported energy for the month  (kWh) (Electricity generated by SSEG and not utilised for own use) | Estimated maximum instantaneous exported power  (kVA) | Day of week that maximum power export occurs | Time of day that maximum power export occurs |
| January |  |  |  |  |  |
| February |  |  |  |  |  |
| March |  |  |  |  |  |
| April |  |  |  |  |  |
| May |  |  |  |  |  |
| June |  |  |  |  |  |
| July |  |  |  |  |  |
| August |  |  |  |  |  |
| September |  |  |  |  |  |
| October |  |  |  |  |  |
| November |  |  |  |  |  |
| December |  |  |  |  |  |
| Total |  |  | N/A | N/A | N/A |

|  |
| --- |
| Brief explanation of the reasons for the general load profile and electricity export profile as demonstrated above : |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Make & model of key generating equipment:** | Manufacturer: |  | |  |  |
|  | Model: |  | |  |  |
|  | Serial Number: |  | |  | **✓** |
| (Tick appropriate box) | Phase: | Single |  | Three |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Electrical parameters of small scale embedded generation[[8]](#footnote-8):**  (All units in parallel, to be used for fault-level studies. Not all of these parameters apply to all modes of SSEG. Insert N/A if not applicable) | Rated voltage | Maximum MVAR limit | Inertia constant | |
|  |  |  | |
|  |  |  |  | |
|  | Maximum peak short-circuit current(A) | Single- or  three-phase |  | |
|  |  |  |  | |
|  |  |  |  | |
|  | Neutral to earth resistance in ohms | Xd – Synchronous reactance in p.u. | X’d – Direct axis transient reactance in p.u. | |
|  |  |  |  | |
| **ELECTRICITY SERVICES**   |  |  | | --- | --- | | **APPLICATION FOR THE CONNECTION OF SMALL SCALE EMBEDDED GENERATION** |  | | | | | |
|  | X”d – Direct axis sub-transient reactance in p.u. | X2 – Negative sequence reactance in p.u. | | X0 – Zero sequence reactance in p.u. |
|  |  |  | |  |

|  |  |  |
| --- | --- | --- |
| **Electrical parameters of generator and unit transformers[[9]](#footnote-9):** | Voltage and power ratings | Winding configuration |
| (Not all of these parameters apply to all modes of SSEG. Insert N/A if not applicable) |  |  |
|  |  |  |
|  | Neutral earth resistor or reactors (NER / NECR impedance) |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
|  | Positive and zero sequence impedances in p.u. | |
|  | R1 | X1 |
|  | R0 | X0 |

|  |  |
| --- | --- |
| **Grid connection point:**  (In the case of applicant not being an existing customer only, attach a single line diagram showing arrangement) |  |

|  |  |  |
| --- | --- | --- |
| **Protection details[[10]](#footnote-10):** | Method of synchronising:  (Auto/Manual, make and type of relay, etc.) |  |

|  |  |  |
| --- | --- | --- |
|  | Method of anti-islanding:  (Details of scheme, relays to be used, etc.) |  |

**ELECTRICITY SERVICES**

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| **APPLICATION FOR THE CONNECTION OF SMALL SCALE EMBEDDED GENERATION** |  |

|  |  |  |
| --- | --- | --- |
|  | Method of generator control:  (AVR, speed, power, PF, excitation system requirements etc. relays to be used) |  |

|  |  |  |
| --- | --- | --- |
|  | Other main protection to be applied:  (O/C, E/F, over/under voltage, over/under frequency, reverse power, back-up impedance, generator transformer back-up earth fault, HV breaker fail, HV breaker pole disagreement, etc.) |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Recording of quality of supply devices | |  | |
|  |  | |  | |
|  | |  | | **✓** |
| **List of regulatory approvals, requirements and normative references[[11]](#footnote-11):**  (Tick appropriate box or mark not applicable N/A) | | Electricity Regulation Act, Act 4 of 2006 and Electricity Regulation Amendment Act, Act 28 of 2007 | |  |
| Occupational Health & Safety Act, No. 85 of 1993 as amended | |  |
| South African Distribution Code (all parts) | |  |
| South African Grid Code (all parts) | |  |
| South African Renewable Power Plants Grid Code | |  |
| Municipality of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Electricity Supply By-Law | |  |
|  | | SANS 474 / NRS 057 : Code of Practice for Electricity Metering | |  |
|  | | SANS 10142- Parts 1 to 4: The wiring of premises (as amended and published) | |  |
|  | | NRS 048: Electricity Supply – Quality of Supply | |  |
|  | | NRS 097-1 : Code of Practice for the interconnection of small scale embedded generation to electricity distribution networks : Part 1 MV and HV | |  |
|  | | NRS 097-2 : Grid interconnection of small scale embedded generation :  Part 2: Small scale small scale embedded generation | |  |

**ELECTRICITY SERVICES**

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| **APPLICATION FOR THE CONNECTION OF SMALL SCALE EMBEDDED GENERATION** |  |

**Clearance by other Municipal departments**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| FUNCTION | SECTION | COMMENTS | NAME | SIGNATURE | DATE |
| Zoning/subdivision/ building structure plans | Planning and Building Development Management |  |  |  |  |
| Noise impact assessment and ventilation | Municipality Health Specialised Services |  |  |  |  |
| Air pollution and quality  (Fuel burning) | Municipality Health Specialised Services |  |  |  |  |

Note:

1. Electricity Services shall require **prior** approval from these departments. Applications to connect to the municipal electrical grid shall not be considered until all relevant approvals have been obtained.
2. Photovoltaic (PV) SSEG applications shall require approval from only Planning and Building Development Management if:
3. Roof top installations: PV panel(s) in its installed position projects more than 1.5m, measured perpendicularly, above the roof and/or projects more than 600mm above the highest point of the roof;
4. Installations on the ground: PV panel(s) in its installed position projects more than 2.1 metres above the natural/finished ground level.

**Installer Details**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Installer: |  | | | | | | |
| Accreditation/qualification: |  | | | | | | |
| Professional registration: |  | | | Reg. No. | |  | |
| Address: | | | | | | | |
|  | | | | Postal code: | | |  |
| Contact person: |  | | | | | | |
| Telephone no: | Office: |  | Mobile: | |  | | |
| Facsimile: | E-mail address: |  | | | | | |

|  |  |
| --- | --- |
| **Any other additional information:** |  |

I request the Municipality of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Electricity Services Department to proceed with the review of this small scale embedded generation interconnection application. I understand that:

* I shall have to pay for both in-house and outsourced engineering studies conducted as part of this review, should these be required; and
* A quotation for such work shall be provided beforehand, giving me the opportunity to cancel or modify the application should I wish to do so.

I further consent to Municipality of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ providing this information to the National Transmission Company and other Distributors as required.

**ELECTRICITY SERVICES**

|  |  |
| --- | --- |
| **APPLICATION FOR THE CONNECTION OF SMALL SCALE EMBEDDED GENERATION** |  |

|  |  |  |
| --- | --- | --- |
| **Application completed by:** | Name: | Title: |
|  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **ECSA registered professional** | Name: | Reg. no: | Registration category: |

(Note: Sign-off by an ECSA registered professional is optional at application stage, however it is recommended that an ECSA registered professional engineer or professional technologist that is familiar with the technical details of the intended generation technology, complete this application form)

|  |  |
| --- | --- |
| **Signed (Applicant):** |  |
|  |

Telephone number:

Email address:

|  |  |
| --- | --- |
| **Date:** |  |

Telephone number:

Email address:

|  |  |
| --- | --- |
| **Signed (property owner):** |  |
|  |

|  |  |
| --- | --- |
| **Date:** |  |

|  |
| --- |
| **FOR OFFICE USE** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date application received:** |  | | | | |  | **Application**  **notification No.** |  |
|  | | | | |  |
|  |  | | | | |  |  |  |
| **Further Information Required (e.g. Competent Person detail required in terms of Occupational Health and Safety Act, General Machinery Regulations: Supervision of Machinery, Section 2):** | YES |  | | NO |  |  | **Date**  **received:** |  |
|  | | | | |  |
|  | | | | |  |
|  |  | | | | |  |  |  |
| **More detailed studies Required (fault level, voltage rise, unbalance, flicker, harmonics, protection, etc.):** | YES |  | | NO |  |  | **Date**  **complete:** |  |
|  | | | | |  |
|  | | | | |  |
| **Approved in Principle:** | YES |  | | NO |  |  | **Date applicant advised:** |  |
|  | | | | |  |
|  |  | | | | |  |  |  |
| **Copy to System Control:** | YES | |  | NO |  |  | **Date completed:** |  |
|  |  | | | | |  |  |  |
| **Copy to distribution district Installation inspector:** | YES | |  | NO |  |  | **Date**  **completed:** |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Copy to MV/HV Section for SSEG > 1kV:** | YES |  | NO |  |  | **Date**  **completed:** |  |

# Annexure C - SSEG installation commissioning report

**ELECTRICITY SERVICES**

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| --- |
| **SSEG Installation Commissioning Report** |

The following SSEG Commissioning Report must be submitted for each installation, confirming compliance with the Municipality’s requirements.

|  |  |
| --- | --- |
| **Site details** | |
| Property address (incl. post code) |  |
| Business partner & contract account numbers |  |
| **Contact details** | |
| SSEG property owner |  |
| Contact person |  |
| Contact telephone number |  |
| **SSEG details** | |
| Manufacturer and model type |  |
| Serial number/s of inverter/s and independent disconnection switching unit/s (if not integrated into one of the components of the embedded generator) |  |
| Serial number / version numbers of software (where appropriate) |  |
| SSEG rating (kVA) and power factor  (under normal running conditions) |  |
| Single or three phase |  |
| Maximum peak AC short circuit  current (A) |  |
| Type of prime mover (e.g. inverter or rotating machine) and fuel source (e.g. sun, biomass, wind) |  |
| Location of SSEG within the installation |  |

**ELECTRICITY SERVICES**

|  |  |  |
| --- | --- | --- |
| **Installer details** | | |
| Installer |  | |
| Accreditation/qualification |  | |
| Address (incl. post code) |  | |
| Contact person |  | |
| Telephone number |  | |
| Fax number |  | |
| E-mail address |  | |
| **Information to be enclosed** | | |
| Final copy of circuit diagram | |  |
| Inverter type test Certificate of Compliance and Test Report according to NRS 097-2-1, issued by accredited 3rd party test house (not necessary if already provided). | |  |
| Factory setting sheet or other documentation showing that the inverter has been set according to NRS 097-2-1 | |  |
| An electrical installation Certificate of Compliance. | |  |
| Signed contract for SSEG | |  |
| Operation and maintenance procedure | |  |
| **Compulsory declaration – to be completed by ECSA registered Pr Eng or**  **Pr Tech Eng** | | |
| The SSEG installation complies with the relevant sections of NRS 097-2-1. | |  |
| The loss of mains protection has been proved by a functional test carried out as part of the on-site commissioning, e.g. a momentary disconnection of the supply to the SSEG in order to prove that the loss of mains protection operates as expected. | |  |
| Protection settings have been set to comply with NRS 097-2-1 | |  |
| Safety labels have been fitted in accordance with NRS 097-2-1 | |  |
| The SSEG installation complies with the relevant sections of SANS 10142-1 and an installation certificate of compliance is attached. | |  |
| Reverse power blocking protection system installed and commissioned to prevent reverse power flow onto the municipal electrical grid (where applicable). | |  |
| Comments (continue on separate sheet if necessary) | | |
| Name: | Signature: | Date: |
| ECSA professional category: | Reg. No. |

# Annexure D - SSEG decommissioning report

**ELECTRICITY SERVICES**

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| --- |
| **SSEG Decommissioning Report** |

|  |  |
| --- | --- |
| **Site details** | |
| Property address (incl. post code) |  |
| Business partner account number |  |
| Contract account number |  |
| Telephone number |  |
| **SSEG details** | |
| Manufacturer and model type |  |
| Serial number/s of inverter/s and independent disconnection switching unit/s (if not integrated into one of the components of the embedded generator) |  |
| SSEG rating (A) |  |
| Type or prime mover and fuel source |  |

|  |  |  |
| --- | --- | --- |
| **Decommissioning agent details** | | |
| Name |  | |
| Accreditation/qualification |  | |
| Address (incl. post code) |  | |
| Certificate of Compliance number (provide certified copy of the CoC which confirms that the SSEG has been disconnected effectively from the municipal electrical grid). |  | |
| Contact person |  | |
| Telephone number |  | |
| Fax number |  | |
| E-mail address |  | |
| Name: | Signature: | Date: |

# Annexure E - List of inverters approved by \_\_\_\_\_\_\_\_ Municipality

Please see separate document.

1. Anyone wanting to connect a SSEG system greater than 1 MW shall not be able to connect under the conditions of these guidelines. In addition, a generating licence or exemption letter from NERSA is needed before connection can be considered. [↑](#footnote-ref-1)
2. Anyone wanting to connect 1 MW or greater shall not be able to connect under the conditions of these guidelines. In addition a generating licence or exemption letter from NERSA is needed before connection can be considered. [↑](#footnote-ref-2)
3. As there is no clarity regarding generation, both for ‘own use’ and ‘not for own use’, that is less than 1MW and that continues to consume more energy than they produce on a consecutive 12-month period an installation that fulfils these criteria does not need a licence. [↑](#footnote-ref-3)
4. PV systems installed on the ground - no building plans are required to be submitted provided the panels in their installed position do not project more than 2.1 metres above the natural/finished ground level. Full building plans are required where any part of the installation projects more than 2.1 metres above the ground level. Other installations clearance required for other embedded generation such as wind. [↑](#footnote-ref-4)
5. Large-scale embedded generation installations would require environmental authorisation (EA) in terms of the NEMA 2010 EIA Regulations if they generate > 10 MW electricity, or more. In addition, the electrical transmission infrastructure that may be associated with a large scale embedded generation system would also require EA if it has a capacity of 275 kV or more within an urban area, or more than 33 kV outside urban areas. [↑](#footnote-ref-5)
6. For guidance here, it is recommended that an installer/supplier be consulted. [↑](#footnote-ref-6)
7. This shall mainly apply to systems that make use of rotating machines e.g. wind power, hydro or diesel generators. For static power converters (e.g. inverters with a solar PV system), the power factor is generally 1 and the kWp of the system shall be the same as the kVA. [↑](#footnote-ref-7)
8. Professional or reputable installer/supplier should provide. For static power converter-based systems (e.g. solar PV inverters) many of these electrical parameters do not apply. [↑](#footnote-ref-8)
9. Professional or reputable installer/supplier should provide. For static power converter-based systems (e.g. solar PV inverters) many of these electrical parameters do not apply. [↑](#footnote-ref-9)
10. Professional or reputable installer/supplier should provide. [↑](#footnote-ref-10)
11. Note: It is the responsibility of the ECSA registered professional engineer/technologist to ensure compliance through their professional sign-off of the installed system in Appendix 1 – SSEG Installation Commissioning Report. [↑](#footnote-ref-11)