NDLAMBE MUNICIPALITY

SMALL-SCALE EMBEDDED GENERATION POLICY

2026/2027

REVIEWED: 02/03/2025
APPROVED BY COUNCIL:
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1. OBJECTIVES

This policy facilitates the inclusion of Small-Scale Embedded Generation (SSEG) onto the electricity distribution network (grid) of Ndlambe Municipality (Ndlambe), so that safety, power quality, grid operation and municipal revenue issues are adequately addressed, and that the local renewable energy industry and green economy is promoted at the same time, supporting job creation.

2. DEFINITIONS:

"Accredited installer" An installer that have Solar PV SSEG installation training, and PV green card or equivalent qualification.

"Four Quadrant meter, 4 wire " A meter that independently measures and record the electricity consumption and demand in all 4 quadrants. In other word kWh and kvarh are measured accurately in the forward and reverse direction.

"Consumer" In the context of this document, consumers who also generate will be referred to as "consumers" although in actual fact they are "consumer/generators".

"Embedded Generator" An entity that operates one or more generation sources that include energy conversion device(s), static power converter(s), if applicable and the control and protection gear within customer's network that operates in synchronism with the utility's network.

"Export tariff" A payment for every kilowatt-hour (kWh) of surplus electricity a customer system exports (Feed-in) to the grid.

"Import tariff" A payment for every kilowatt-hour (kWh) of electricity imported by a customer from the grid.

"Islanding" When an Embedded generator instantly and automatically disconnect the generator from the municipal electrical grid whenever there is a power outage in the utility municipal electrical grid.

"Automatic isolation" The automatic, interlocked, disconnection from the Municipal Grid in case of loss of Municipal power thus preventing the export of electricity to the municipal electrical grid

"Municipality" Ndlambe Municipality

"Reverse power flow" The flow of energy from the consumer electricity installation onto the grid as a result of the instantaneous generation exceeding the instantaneous consumption at the generation site in question.

"SSEG" Small Scale Embedded Generation. For the purpose of this policy; an embedded generator with a generation capacity of up to 100 000kVA (100MVA) (definition further elaborated below).

"Tariff" A combination of charges to recover measured quantities such as consumption and capacity costs as well as service costs.

"Generating capacity" The maximum amount of electricity, measured in kilovolt ampere (KVA) limited by the maximum rated capacity of the inverter. (The maximum generated alternating power flow that can be generated by the generator)

"Grid-tied" A generator that is connected directly to the utility grid or through the customers internal wiring (electrically connected) , in synchronism. The generator will shut down in case of loss of municipal power.

"Grid-tied hybrid Generator" Embedded generator equipped with energy storage that islands after interruption of the utility supply or when the applicable electrical service conditions are outside stated limits or out of required tolerances and then supplies the consumer load from the inverter.

"Inverter" A power device that converts direct current to alternating current.

"**Grid Tied inverter**" Inverter that generates alternating current at a voltage and frequency which enables the generator to be connected to the utility's electrical grid.

" Grid Tied Hybrid Inverter" Inverter that generates alternating current at a voltage and frequency which enables the generator to be connected to the utility's electrical grid and can synchronise with the grid after islanding and reconnecting to the grid.

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"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 33 kV.
"Net consumer" A consumer that purchases (imports) more kWh of electricity than they export (sell) on a monthly basis.
"**Net generator**" A situation where the site generates more electricity than is consumed on site on a monthly basis, and therefore exports more power onto the municipal network than it draws from the network.
"Off- grid / Stand-alone Generator" A generator that is physically separated and isolated (electrically separate) from, and can never be connected to the utility grid – either directly or through a customer's internal wiring is said to be "Off-grid" The consumer's electrical installation's load cannot be simultaneously connected to the utility grid supply and the generator supply (connected in parallel), never be able to synchronize with the utility grid supply depending on the customer's electrical installation's loading, irrespectively if reverse flow is possible. A generator connected to the grid through a reverse flow blocking relay is not considered as "Off-grid" but as an EG (Embedded generator)
"Pr Eng, Pr Tech Eng, Pr Cert Eng or Pr Techni Eng" This refers to a professional engineer, professional technologist, professional certificated engineer or professional engineering technician who is registered with the Engineering Council of South Africa (ECSA).
"Interlocked change-over switch" Switch required preventing the utility supply to never be able to electrically connect the generator supply with the utility supply.
"Shared network" A section of the utility grid that supplies more than one customer.
"Wheeling" The deemed (not necessarily actual flow of kWh) transportation of electricity, over a utility's electrical network from an one generator / SSEG to a third party electricity consumer.

3. ACRONYMS AND ABBREVIATION

DC	Direct current
ECSA	Engineering Council of South Africa
EG:	Embedded Generation
ESD:	Electrical Services Department
IRP:	Integrated Resource Plan
kVA:	kilo-Volt Ampere (unit of electrical apparent power)
kvarh:	kilo-volt-ampere-hour (reactive energy)
kW:	kilo-Watt (unit of electrical real power)
kWh:	kilo-Watt-hour (real energy)
kWp:	kilo-Watt peak (the rated peak output of solar PV panels)
LV	Low Voltage
MV	Medium Voltage
MVA:	Mega-Volt Amperes (1000kVA)
MW	Mega-Watt (1000 kW)
NERSA:	National Energy Regulator of South Africa
NMD	Notified Maximum Demand
PV	Photovoltaic
SSEG:	Small Scale Embedded Generation/Generator
VAT	Value Added Tax

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4. BACKGROUND

Steep increases in the price of electricity, elevated environmental awareness, rapidly decreasing costs of photovoltaic (PV) panels, and the high risk of national power blackouts have all resulted in electricity distributors around the country receiving numerous requests to allow electricity consumers to connect PV and other Small-Scale Embedded Generators (SSEGs) to the grid. Such SSEGs are intended to be connected to the wiring on the

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consumer's premises which is in turn connected to, the grid. Such generators are hence considered to be 'embedded' in the local municipal electricity grid.

The parallel (or embedded) connection of any generator to the grid, however powered, has numerous implications for the local electricity utility. The most significant implications are the safety of the utility staff, the public and the user of the generator. Further implications include the impact on the quality of the local electrical supply, and metering and billing issues. In terms of the Municipal Structures Act, No. 117 of 1998, municipalities are therefore obliged to regulate the installation of SSEGs to uphold responsible management of the distribution network, as well as for the general benefit and protection of citizens.

Although the electricity distribution industry is highly regulated, SSEG's have not yet been adequately covered in national policy or legislation. The AMEU has developed standardized approaches and documentation to support municipalities in this regard, aligned with national policies and regulation, and this Policy is consistent with the AMEU approach and recommendations.

Municipal distributors are obliged to ensure that distribution grid power quality and safety standards are upheld to protect municipal staff working on the distribution system, to protect the public in general, and to protect municipal infrastructure. Also, the potential revenue impact of accelerating SSEG installations needs to be managed. This requires changes to tariff structures, in particular residential tariffs.

The above needs to be balanced with municipal obligations to embrace low-carbon energy and green economic growth opportunities, so a user-friendly framework around installation application and approval is important to promote the growth of this sector. Such a framework will also minimise systems being installed without going through official channels, thereby potentially not meeting required safety and quality standards.

Municipalities play a vital role in facilitating the necessary regulatory environment to enable the establishment and growth of the SSEG field. This document outlines the municipal requirements for prospective SSEGs such that the above factors are balanced.

5. SMALL SCALE EMBEDDED GENERATION DEFINTION

Small-scale embedded generation (SSEG) refers to power generation up to 100MVA peak output capacity, such as PV systems or small wind turbines which are located on residential, commercial, agricultural or industrial sites where electricity is also consumed. SSEG is in contrast to large-scale wind farms and solar parks that generate large amounts of power, typically in the multi-MW range. Most of the electricity generated by an SSEG is consumed directly at the site but times arise when generation exceeds consumption and a limited amount of power is allowed to flow in reverse - from the consumer onto the grid.

An SSEG therefore generates electricity that is "embedded" in the local electricity distribution network in that it is connected to the consumers wiring, behind the consumers meter, which is in turn connected to the grid. When a customer wants to feed-in more energy into the network than that which it consumes for this part will not be classified as a SSEG at this stage.

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6. INDEMNITY, LEGAL REQUIREMENTS & CURTAILMENT

Legal and Illegal Connections to the municipal electrical grid:

Customers wishing to connect SSEG legally to the municipal electrical grid shall be required to follow the normal application procedure as detailed in this document, and comply with the regulations and standards listed herein.

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 / disconnection. 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 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. The SSEG Decommission form (Appendix 5), and 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. The applicable fine will be payable, and the relevant decommission documentation above be submitted, before the electrical supply to the property will be restored. Applicable fines will be imposed for 2nd and 3rd time offenders, and the possible permanent disconnection of the electrical supply to the property.

In cases where unauthorised reverse feed-in takes place which results in the meter reversing to the benefit of the customer, the Municipality will institute action to recover lost revenue and relevant punitive fines will be applicable.

No exemption from any of the Municipality's requirements shall be granted for "retrospective applications".

7. POLICY PRINCIPLES

This policy is guided by the following principles:

- Consumers are not allowed to connect SSEG to the municipal grid without the written consent of the Municipality. Consumers found to have illegally connected SSEG to the grid (either before or after their electricity meter) will be instructed to have the installation disconnected from the grid. Should the consumer fail to have the SSEG disconnected from the grid, the Electricity department reserves the right to disconnect the electricity supply as stipulated within the Electricity By-laws.
- The document 'REQUIREMENTS FOR SMALL-SCALE EMBEDDED GENERATION: Conditions and application process to become an embedded generator in Ndlambe Municipality' (hereinafter 'REQUIREMENTS document') specifies detailed technical, procedural and other conditions and parameters that must be adhered to.
- Consumers who wish to connect SSEG to the municipal grid are required to follow the application procedure as detailed in this document.
- Any existing SSEG systems or applications submitted prior to the adoption of this Policy will have to demonstrate compliance with this Policy through following the application procedure specified herein.
- Existing legislation requires that systems up to 100MVA do not need a NERSA license. The Municipality will process applications for SSEG systems up to 100MVA without evidence of a generating license. Anyone wanting to connect greater than 100MVA must

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produce a generating license or exemption letter from NERSA with their application. Should the licensing regulations change, SSEG customers will be required to comply with the new regulations at their own cost.
- All embedded generation systems installed within the Municipality's grid must be signed off on commissioning by appropriate personnel as defined in the REQUIREMENTS.

8. POLICY STATEMENT

The Ndlambe Municipality supports the installation of SSEG capacity by its consumers under the following conditions:

- Any installation must follow the specified application process to the municipality and NERSA where applicable.
- The installation may not commence until municipal approval has been granted which will not be withheld without reason.
- Any installation will be subject to the requirements and conditions of the law and any municipal requirements which could include the chocking of the system to stop any feed-in.
- The supply to the consumer will be subject to disconnection if any of the conditions are not met especially in case where the safety of municipal staff or stability of the network is jeopardised.
- The capacity of the SSEG as well as the Export power will be limited relative to the installed capacity / demand of the consumer.
- Any SSEG consumer will be required to pay the required monthly metering /admin fee including cost for a 4 quadrant, 4 wire meter with remote communications.
- Any SSEG consumer will be charged on a TOU tariff with basic, capacity (demand) charge with TOU energy charges.
- Any approved export into the Ndlambe network will be compensated at 80% of Eskom's energy rates as appliable to Ndlambe.
- Compensation for feed-in will be as a credit on the consumer's energy bill, (excluding any fixed, capacity or demand charges), and such credit will not exceed the energy charges by the municipality for consumption by the consumer in the Municipal financial year.
- Consumers who have installed SSEG before approval of this policy must comply with all the requirements but will be given until 1 July 2026 to meet all requirements.
- Any consumer within a current electrified area who goes off-grid, in other words does not want a connection to the Municipal network, will still be subject to the standard availability charges as approved from time to time.

9. SCOPE OF THE POLICY

- This policy document provides a framework for the approval and registration of SSEGs as well as the regulation thereof relative to the requirements of the Municipality and all other Policies, By-laws and Legislation applicable thereto.
- The policy is applicable to all customers wishing to install systems categorised as SSEGs.
- The policy covers:
  - The conditions under which SSEG will be accepted onto the grid
  - The Application and Commissioning process
  - Contractual arrangements between the SSEG customer and the Municipality
  - Metering and tariffs for SSEG
- The policy covers all prospective SSEG customers in the municipal distribution area connected to the grid.

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10. *CONSTITUTIONAL, REGULATORY AND POLICY CONTEXT

Section 156 (1) and Schedules 4B and 5B of the Constitution assign municipalities authority and administration over 'Electricity and gas reticulation'. The municipality has legislative and executive authority in this area, and thus must develop a regulatory environment which ensures the safe and proper functioning of their electricity grid in terms of the Municipal Structures Act, No. 117 of 1998. This environment must not contradict the national regulatory framework. Since embedded generators are connected to, and impact on the local distribution grid, municipalities must develop an appropriate regulatory framework for such generators. The electricity reticulation function extends to providing open and non-discriminatory access to the municipal distribution system and to permit the connection of embedded generation systems[1].
Section 74 of the Municipal Systems Act requires the municipality to set appropriate tariffs for municipal services. The use of the municipal distribution grid by embedded generators therefore requires that the municipality sets a suitable tariff for such generators.

The National Energy Regulatory of South Africa issues electricity generation licenses in terms of the Electricity Regulation Act. Schedule 2 of this act specifies that only systems over 100 MW capacity currently require licensing. This also applies to embedded generators.

Technical specifications and standards have been developed to guide the implementation of embedded generation such that safety, power quality, and grid operational parameters are not negatively impacted, complying with NRS097-2 *The wiring of premises;* and SANS 10142-1-2: *Specific requirements for embedded generation installations connected to the low voltage distribution Network in South Africa.*

Local government is given a key role in implementation within the following documents:

- The White Paper on Energy Policy (1998)
- The National Climate Change Response White Paper (2011)
- In addition, the Integrated Resource Plan directing electricity supply in the country increasingly recognizes the role of local government and of embedded generation.

In addition to the above obligations, local government should align with:

- White Paper on the Promotion of Renewable Energy and Clean Energy Development (2003)
- The transition to a green economy
- National carbon mitigation intentions

Paragraph 4 of the Distribution Code sets out the responsibilities of distributors and stipulates in paragraph 4(1) that the distributor shall make capacity available on its networks and provide open and non-discriminatory access for the use of this capacity to all customers including embedded generators.

11. AMEU / SALGA STANDARD DOCUMENTATION

[1] ~~Paragraph 4 of the Distribution Code sets out the responsibilities of distributors and stipulates in paragraph 4(1) that the distributor shall make capacity available on its networks and provide open and non-discriminatory access for the use of this capacity to all customers including embedded generators.~~

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The Association of Municipal Electricity Utilities and SALGA has developed a set of Standard documents which provide a sound approach for engaging with SSEG by municipalities. The documents have been reviewed by a municipal SSEG Working Group and provide a framework to facilitate the establishment of systems to process and integrate SSEG into municipal operations. This Policy is in accord with this SALGA/AMEU framework.

12. TYPES OF SSEG AND REQUIREMENTS

This section explains the different types of embedded generation and the different treatment of each. The focus is not to repeat any of the detailed stipulations made in NRS 097-2 or any other standard. The differences will be explained relative to the following aspects namely:

- Requirement to obtain license from NERSA or register with utility.
  - 100 kW up to 100 MW register direct with NERSA / copy to municipality. (schedule 2 amendments)
  - Any SSEG with capacity exceeding 100 MW need a license from NERSA before applying to the distributor to connect its generator to the grid.
  - Any SSEG less than or equal to 100 kW only need to apply to the utility and comply with its requirements.
  - If the owner of the SSEG or the person / organization running the SSEG system on a premises is not the owner of the premises themselves, (Existing legislation requires that anyone generating electricity "not for own use" must obtain a generating license from the National Energy Regulator of South Africa (NERSA).
- Fees, Tariffs and Feed-in tariff stipulations.
  - Up front charges.
    - Cost of capital and installation of a four quadrant four wire meter with remote communications.
    - Any costs required to meter, monitor, connect, upgrade network or protection will be at the expense of the SSEG.
    - Cost of any network impact studies in case of bigger systems.
    - Any other costs associated with obtaining approval for the SSEG connection to the municipal grid.
    - Specialist test that are required, e.g. Inverter testing
    - In cases where the electricity flow in any network is increased, thus possible leading to an earlier upgrade of the network;
      - Standard Development charges (DCs) will apply in respect of the total generation capacity of SSEG in respect of the networks where capacity will be increased.
      - Additional monthly network charges excluding the Eskom Maximum demand and Access charges, will be levied in respect of the networks where load could be increased.
      - The total SSEG generation load will be subject to the standard network capacity and demand charges of the municipality in respect of the relevant networks but excluding the Eskom Maximum demand and Access charges,
  - Standard tariff for connection to the grid.
    - All SSEs be charged at the standard utility cost reflective tariff as determined by a cost of supply study and approved by NERSA.
    - All only supply generators be charged at rates to be supported by cost of supply study and approved by NERSA.
  - Feed-in rates.
    - The standard SSEG feed-in rate and additional Basic charge will apply to all SSEG consumers.
    - Any SSEG exceeding 1 MW including only supply generators will be subject to a competitive bidding process to comply with the MFMA.

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        - It is important to know that the municipality may at any stage limit the amount of feed-in any area and if not complied with such supplies could be subject to disconnection.
- Connection limits and requirements. The levels indicated below are indicative and the municipality may at any time request further studies or requirements where it could jeopardise the integrity or safety of the grid.
    - LV connected supplies with dedicated LV feeder / Transformer:
        - Max EG capacity ≤ 75% of NMD or installed capacity limit in kVA.
        - Multiphase supplies > 4.6 kVA be balanced over all phases.
        - Single phase max EG capacity = 13.8 kVA,
        - Total EG capacity should be less than 75 % of the MV/LV transformer rating.
        - Voltage rise between the point of supply and transformer busbar is limited to 1 %.
        - In the case of non-compliance with any of the above criteria additional generation cannot be connected to the network without further detailed studies.
    - LV connected supplies with shared LV feeder / Transformer:
        - Max EG capacity ≤ 75% of NMD or installed capacity limit in kVA.
        - Max feed-in Power ≤ 25% of NMD or installed capacity limit in kVA.
        - Multiphase supplies > 4.6 kVA be balanced over all phases.
        - Max individual EG capacity = 20 kVA,
        - Total EG capacity should be less than 25 % of the MV/LV transformer rating.
        - Voltage rise between the point of supply and transformer busbar is limited to 1 %.
        - In the case of non-compliance with any of the above criteria additional generation cannot be connected to the network without further detailed studies.
    - MV Feeder connected supplies.
        - Any EG capacity exceeding 350 kVA.
        - Max EG capacity ≤ 15% of MV feeder load.
        - Only Multiphase supplies.
        - In the case of non-compliance with any of the above criteria additional generation cannot be connected to the network without further detailed studies.

    - Other requirements.
        - The maximum change in LV voltage (due to voltage drop/rise in the MV/LV transformer and LV
        - feeders) due to embedded generators is limited to 3 %.
        - LV voltage regulation should be within the limits specified in NRS 048-2 (LV voltages at the customer point of supply should be within ± 10 %);
        - Thermal ratings of equipment (lines, cables and transformers) may not be exceeded.
        - The fault level at the customer point of supply should be greater than 210 A, or the minimum fault level at which the generator is rated.

    - Saturation.
        - Ndlambe holds the right to limit the amount of feed-in from SSEG generation on any part of the network where the quality of supply could be jeopardised.
- Professional Sign off.
    - All SSEG projects equal and greater than 50 kW shall be signed off on commissioning by a professional engineer, professional technologist, professional certificated engineer or professional engineering technician who is registered with the Engineering Council of South Africa (ECSA Registered).
- Accredited Installer

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- All SSEG installations to be done by an accredited installer. (PV Green card or equivalent).

- Testing of Inverters
  - Until such time as a 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 certifying compliance of the inverters with NRS097-2-1 (and NRS097-2-2 when published). The use of inverters without such certification is not permitted, both in new and existing installations.
  - The certification body must be SANAS accredited or be recognised by the International Laboratory Accreditation Co-operation (ILAC) or the International Accreditation Forum (IAF) in terms of ISO/IEC 17025:2005 for photovoltaic systems. The accreditation bodies must provide accreditation documentation for the specific test location.
  - The SSEG applicant should require the inverter suppliers to provide the necessary certification before the equipment is purchased.
- Transfer of power to a different location is not permitted: The power produced by the SSEG must be utilised on the property on which the generator is located, or fed onto the utility network for credited by the Municipality. The following are not permissible:
  - Installation on a different property to where the power is used (e.g. installing solar PV panels on a neighbour's house's roof)
  - Supplying power from an SSEG on your premises to another premises (e.g. selling
  - power to neighbours or to supply another premises elsewhere in the town). This is also known as wheeling.
  - Supplying or selling electricity to tenants or to more than one customer on the same premises where the
  - SSEG is installed. (approval must be given by the Ndlambe Council for such installations)

13. COMPLIANCE IMPLICATIONS

The previous paragraph stipulated the qualifying criteria before a SSEG can connect to the grid. This section stipulates what need to be monitored and what corrective action can be taken in cases of non-compliance.

TECHNICAL REQUIREMENT	MONITORING	CORRECTIVE ACTION
EG feed-in power exceeds approved limits.	Monitor monthly ½ hourly readings	Notification to rectify in 30 days, disconnect supply
Phase unbalance.	Monitor monthly ½ hourly readings	Notification to rectify in 30 days, disconnect supply
Harmonics. < 5 % at rated generator output	Quality of supply meters, customer complaints	Notification to rectify in 30 days, disconnect supply
Power factor. Usage < 0.9, No Feed-in of vars, No negative.	From monthly ½ hourly readings	Notification to rectify in 30 days, disconnect supply
Voltage limits.	4 quadrant meters to monitor	Upgrade network or limit feed-in.
Voltage rise: LV feeders < 1 %	Quality of supply meters	Upgrade network or limit feed-in.
Synchronisation	Circuit breaker trips, customer complaints,	Notification to rectify in 30 days, disconnect supply
Flicker	Quality of supply meters, customer complaints	Notification to rectify in 30 days, disconnect supply
Fault levels: > 210 A / minimum generator rating.	Quality of supply meters, customer complaints	Upgrade network or limit feed-in.
Islanding on grid	From monthly ½ hourly readings	Notification to rectify in 30 days, disconnect supply

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DC injection < 1% of rated NMD.	Network problems. Investigation	Notification to rectify in 30 days, disconnect supply
RPP not applied or approved / registered.	Investigation	Notification to rectify in 30 days, charge tamper fine (per month for contravention), disconnect EG after 30 days if not comply, if not disconnect the supply

Various of these parameters cannot be measured easily. In evaluating the systems to be installed compliance by specification will be ensured. In cases where either the system goes faulty or the set-up was changed, the actual performance could change. In some cases, it is possible to detect in others not so. In cases where the contravention:

- could cause short term serious problems the supply to the consumer can be disconnected.
- could cause longer problems the consumer can be required to disconnect the SSEG plant.

14. General Requirements

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 a SSEG system, with generation capacity smaller than 1 MW (1000 kW), to the municipal electrical grid.

Anyone wanting to connect over 1 MW and more shall not be able to connect under the conditions in this document, but should approach the municipality directly to discuss the way forward. It is likely that grid impact studies will be necessary in these circumstances, amongst other work. In addition, a generating licence or exemption letter from NERSA shall be required before connection of systems over 100MW is considered.

14.1. Net customers

All SSEG installations shall consume a higher value energy than they produce on an annual monthly basis as a general rule.

SSEG's can either be "net consumers" or "net generators":
"Net generators" on (an annual basis) purchase less energy value from the utility than they feed back onto the utility grid.

Net generators will be treated on a totally different basis and not as SSEG's.

14.2. Generating licence

Draft legislation stipulates that generators of 100MW or smaller do not require a license from NERSA. Should this requirement change, the Municipality will change the requirements in this document accordingly, and will require all existing and new SSEGs to comply with the new requirements, at their own cost.

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

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14.3. Transfer of power to a different location is not permitted:

The power produced by the SSEG must be utilised on the property on which the generator is located, or fed onto the utility network for credited by the Municipality. The following are not permissible:

- Installation on a different property to where the power is used (e.g. installing solar PV panels on a neighbour's house's roof)
- Supplying power from an SSEG on your premises to another premises (e.g. selling power to neighbours or to supply another premises elsewhere in the town). This is also known as wheeling.
- Supplying or selling electricity to tenants or to more than one customer on the same premises where the SSEG is installed. (approval must be given by the Ndlambe Council for such installations)

14.4. Eskom grid connection

Customers residing within the municipal boundaries, but located in Eskom's area of supply, need to apply to Eskom for consent to connect SSEG to the Eskom electrical grid. The municipality will not be involved in this process.

14.5. Decommission of a 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 owners cost and a decommissioning report filed (on the prescribed form). A decommission confirming Certificate of Compliance (COC) also be handed to the Municipality.

14.6. Transfer/change of ownership

If a transfer of the property and/or change of ownership of the electricity accountholder takes place, a new SSEG Supply Contract shall be signed or alternatively the SSEG system shall be decommissioned.

14.7. Islanding / Anti-Islanding installations

Grid-tied SSSEGs are required to have an anti-islanding function (immediate disconnection when there is a general power outage) as stipulated in the NRS 097-2-1. Certification to this effect is required (see testing of Inverters).

Hybrid Grid Tied SSEGs must have the facility to both comply with these anti-islanding requirements AND operate in "islanded mode" where the SSEG installation supplies power to a portion of the customer's electrical grid during a general power outage, 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, a registered person in terms of the Electrical Installation Regulations (2009) shall 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

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(Section on 'Alternative supplies including low voltage generating sets, installations, etc.) apply.

14.8. Fire safety and emergency shut-off switch

Emergency disconnection switching shall be in accordance with NRS 097-2-1.
A label on the distribution board of the premises where the embedded generator is connected, shall state: "ON-SITE EMBEDDED GENERATION (EG) CONNECTED. THE EG IS
FITTED WITH AN AUTOMATIC DISCONNECTION SWITCH WHICH DISCONNECTS THE EG IN
THE CASE OF UTILITY NETWORK DE-ENERGIZATION."

14.9. Off-grid system

Owners of Stand-alone generators (not connected to the municipal electrical grid in anyway) need to notify the Municipality through the relevant declaration form of the existence of the installation, and need to hand in a Certificate of Compliance for the installation. The installation is subject to an inspection and tests by the Municipality to verify that the installation is off-grid. Installations that are found not to be off-grid, will be deemed as illegally connected to the Municipal electrical grid, and will be requested to disconnect from the Municipal grid, a fine is applicable.

The SSEG application process must then be followed. Approvals from other departments may still be necessary (e.g. building), and it is the responsibility of the applicant to comply with any such requirements. All stand-alone generators must comply with the Electricity Regulation Act.

Off-grid systems within an area with electricity available in the street, in other words an electrified area will still be subject to the municipal electricity availability charges even if not physically connected to the network.

15. Load Management

Customers will manage their consumption and export energy based on their own needs as well as the purchase and export rates. The objective would be to minimise the purchase costs and maximise the export credits. Generally the purchase rates are higher that the export rates. During the more expensive TOU periods the export rate may be more than the purchase rate in another period. This may lead to consumers moving load to the off-peak period, thus using the grid power at the cheapest rate and using their surplus power to export power during the peak period. This is acceptable but consumers must be aware of:

- The current limit in export value equal to the purchase energy value.
- The municipality may at any time limit the amount of export due to system constraints. This will require consumers to modify their load management regime.

Generally find it most financially beneficial to ensure that they utilise as much of the generated electricity to supply their own loads. For example, with a residential SSEG PV system, loads such as geysers and pool pumps could be shifted to the middle of the day when solar generation is typically at its highest – between mid-morning and mid-afternoon.

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16. Metering / billing

Customers with SSEG systems shall be supplied with a Bi-directional TOU meter with remote communications. All conventional and prepaid meters will be replaced by such meter at the customers cost. ~~The municipality may assist consumers with financing of these meters.~~

The municipality will operate and maintain these meters and such costs recovered by way of an additional metering / management fee.

The Smart meters can operate in either post or pre-payment basis. All SSEG consumers will be billed on a post-paid basis and not pre-payment.

The municipality will install the type of meter based on circumstances but all consumers will pay the same price irrespective of type of meter but differentiated for either 1 or 3 phase supplies.

17. Refunds of electricity already pre-purchased

Where applicants currently have prepayment meters, these will need to be replaced with meters appropriate for SSEG systems and tariffs. Refund of Prepayment meter (PPM) units when a customer changes to the SSEG tariff and has an appropriate (credit) meter installed will be undertaken as follows:

- PPM vending unit tokens already loaded on the PPM.
- 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.

18. Other Approvals

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 600mm above the highest point of the roof. If the above parameters are exceeded 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.
- PV systems should be installed in accordance with architectural guidelines and development approval conditions.
- Ground-mounted PV systems: no building plans are required to be submitted provided the panel(s) in its installed position does 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.

Environmental Approvals

- Solar PV SSEG installations covered by this document do not require Environmental Approval .

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19. APPLICATION / REGISTRATION REQUIREMENTS

Consumers are not allowed to connect SSEG to the grid without the written consent of the Municipality. Consumers found to have illegally connected SSEG to the grid (either before or after their electricity meter) will be instructed to have the installation disconnected from the grid. Should the consumer fail to have the SSEG disconnected from the grid, the Electricity department reserves the right to disconnect the electricity supply as stipulated within the Electricity By-laws.

The document 'REQUIREMENTS FOR SMALL-SCALE EMBEDDED GENERATION: Conditions and application process to become an embedded generator in Ndlambe (hereinafter 'REQUIREMENTS document') specifies detailed technical, procedural and other conditions and parameters that must be adhered to. The latest version of this 'REQUIREMENTS' document must be consulted, and adherence to the provisions therein complied with.

Consumers who wish to connect SSEG to the municipal grid are required to follow the application procedure as detailed in the REQUIREMENTS document.

Any existing SSEG systems or applications submitted prior to the adoption of this Policy will have to demonstrate compliance with this Policy through following the application procedure specified herein.

- Existing legislation requires that systems greater than 100 MVA need a NERSA license. Anyone wanting to connect greater than 100 MVA must produce a generating license or exemption letter from NERSA with their application.

- Existing legislation requires that systems greater than 100 kVA and 100 MVA need to register with NERSA. Anyone wanting to connect greater than 100 kVA must produce a copy of the registration with NERSA.

- The Municipality will process applications for SSEG systems up to 100 kVA without evidence of a generating license / registration with NERSA.

Should the licensing regulations change, SSEG customers will be required to comply with the new regulations at their own cost.

All embedded generation systems installed within the Municipality's grid must be signed off on commissioning by appropriate personnel as defined in the REQUIREMENTS document.

20. APPLICATION PROCESS

The Application for the Connection of Small Scale Embedded Generators shall be completed for all embedded generation. Should metering/billing changes be required for the SSEG installation, the general application form for new or modified connections shall also be completed. Contact your nearest Electricity Engineering Services Department office.

Step 1: Visit the Municipality website

- Visit the Municipality's website (www.Ndlambemunicipality.co.za) and download the requirements for Small Scale Generators and the relevant application form/s as noted above or contact your nearest Electricity Services Department office.

- Adhere to the size limitations as per 5.1 and 5.2 on page 15.

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- Download the latest approved inverter list on City of Cape Town's website (www.cityofcapetown.gov.za) for the latest approved inverter list. (Ndlambe Municipality uses City of Cape Town's approved inverter list).

Step 2: Complete application for the connection of Small Scale Embedded generation and, if required, the general application form for new or modified connections

- The Municipality requires that the application form/s be signed by the current electricity account holder.
- Details of the proposed installer shall also be provided
- The applicant may need support from the proposed installer or a registered professional in completing the application form.

Step 3: Obtain permission from other Municipality departments

- The Ndlambe Municipality requires prior approval of the proposed SSEG installation from Planning and Building Development Management Department.

Step 4: Submit completed application form/s and attachments

- Form/s shall be submitted to the relevant contacts at the Ndlambe Municipality.
- Attachments to the application include an initial design circuit diagram, site layout plan showing the location of SSEG's (PV panels, wind turbines, inverter and batteries) and the inverter certification of compliance with NRS 097-2-1. PV panel size (wattage), quantity and combined weight on the roof structure (if applicable) also to be included.

Step 5: Installation commencement upon provisional installation approval from the municipality

- After due consideration of the application, the applicant will be informed in writing whether provisional installation approval to procure/install the system as per application are granted, or not.
- If further information or grid studies are required by the municipality, the applicant will be notified thereof.
- Once notified of a successful application, the applicant may commence installation (it is advised that the applicant does not pay for any equipment until municipal provisional approval to install is granted in writing. The Municipality take no responsibility for equipment procured/paid that do not comply with our requirements.

Step 6: Commissioning and documentation to be submitted to the Ndlambe Municipality.

- Commissioning of systems equal and greater than 50 KW shall be undertaken by a registered professional together with the Municipality', who shall complete and sign off the SSEG Installation Commissioning Confirmation – Appendix 3 page 3,4 and page 8 of application form. (Refer to 3.1 on page 9 of above requirements). Systems smaller than 50 KW need only the accredited installer present to commission the system.
- In addition to the Commissioning Report, the following documentation shall also be completed:
- Final as-built circuit diagram
- Inverter type test certificate according to NRS 097-2-1.

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- An electrical installation Certificate of Compliance as per SANS 10142-1 (and SANS 10142-3 when published).
- A signed SSEG Contract. 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.
- All completed documentation shall be submitted to the relevant Ndlambe Municipality office.

Step 7: Inspection of installation

- The Municipality shall inspect and perform tests on the installation (together with the installer, or registered professional), and issue an internal Municipal test/inspection report.

Step 8. Contractual agreements

- All new SSEG customers must agree to the Municipality's GENERAL TERMS AND CONDITIONS: CONTRACT FOR CONNECTION OF AN EMBEDDED GENERATOR before generation may commence. This contract clarifies the legal responsibilities of both the customer and the Municipality.

Step 9: Approval granted to connect to the municipal electrical grid and generation commences

- If all of the above is satisfactory, the installer shall install the necessary meter.
- Approval to permanently connect SSEG to the municipal electrical grid shall be provided by the Ndlambe Municipality to the customer, in writing, together with any operation and other requirements deemed necessary.
- Once this is done, the change to the tariff shall be implemented if applicable.

Step 10: Repeat the process in the case of SSEG capacity expansion

- Should an expansion or a change to the system be required, a new application shall be completed.

21. RESPONSIBILITY

The Municipal Manager is responsible and accountable for the implementation and enforcement of the provisions of this Policy and must take the necessary steps to do so.

The Municipal Manager shall from time-to-time report to the Executive Mayor on matters relating to this Policy, the efficacy of the tariffs set by the Council in terms hereof, the administrative mechanisms, resources, processes and procedures related to its implementation and the extent to which the Policy is achieving the objectives of the Council.

All the necessary power and authority is hereby delegated to the Municipal Manager to enable him/her to fulfil his/her functions, responsibilities and obligations in terms hereof, including appropriate revisions of the REQUIREMENTS document to keep up to date with this fast-changing field, with full authority to further delegate any specific responsibility.

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22. ORGANISATION REQUIREMENTS

The implementation of SSEG in Ndlambe will require the increase organisation capacity within the Electricity / Energy department. This needs to cater for the following services:

- Handling of the application, analysis, contracting of new SSEGs.
- Monitoring of the installation and issuing of compliance certificates.
- Monitoring of the consumption, feed-in, maximum capacity, power factor, quality of supply and network stability.
- Corrective actions in case of non-compliance.
- Profile data analysis and provision of billing data.
- Periodic reporting and network and financial impact analysis.

23. SSEG TARIFFS

The following tariffs will apply to all SSEG customers whether able to export energy or not:

Supply tariff. This tariff is for the supply of electricity to the consumer and must cover the cost of supplying the consumer and the related metering and consumer services costs plus any return or markups of the municipality. Any consumer with SSEG on its premises must be on these specific tariffs. Different tariffs will apply to different customer categories and points of supply. In time it is expected that all standard tariffs will be cost reflective and can be applied to SSEG customers.

- A basic charge to cover the normal connection and consumer services costs and the costs associated with the 4 quadrant meter.
- A SSEG support charge to cover the additional costs associated with a SSEG supply including the meter supplier hosting costs and municipal management costs.
- A capacity charge to cover the network costs, including a return, based on the installed capacity if the consumer.
- In case of Bulk consumers:
    - An Access charge to cover the more dedicated part of the network costs and Eskom Access charge.
    - A Maximum demand charge to cover the more variable part of the network costs and Eskom maximum demand charge. (This charge will only apply in respect of the demand taken by the consumer and not that feed-into the network except where such demand increases the load on the network).
- Time of Use (TOU) energy charges with the same structure as the Ndlambe bulk electricity purchase costs (Eskom) to cover energy costs and possible markups.

Feed-in tariff. This tariff is for the supply of surplus electricity by the consumer into the grid. This tariff will be the same for all SSEG customers in respect of position of Feed-into the grid.

- This tariff will only contain TOU energy charges with similar structure to the Eskom Bulk tariff to Ndlambe.
- The energy rates will be set at 80 % the Eskom energy rates applicable to Ndlambe.

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- The Feed-in credit will be applied to the consumer's energy bill, excluding any fixed, capacity or demand charges), but to a maximum of the Rand Value of kWh purchased by the consumer within each financial year, initially this will be by month.

The Feed-in tariff will be implemented only once council has approved such a tariff as NERSA indicated it has no jurisdiction in this respect. The billing system also need to be modified to facilitate such credits. Prior to such tariff implementation, feed-into the grid will be permitted, but no financial compensation will be given.

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24. SSEG CONTRAVENTIONS

In cases where an SSEG consumer, whether applied or not, is in contravention of any of the requirements stipulated in the policy will be subject to the following possible actions:

- Where SSEG consumers do not apply to have their systems legalised and do not pay the required meter change fee or sign agreement to repay such meter.
    - In respect of consumers who have installed SSEG system up to the time that this policy is approved. These consumers will be given 2 months from the policy approval date.
    - In respect of consumers who connect new SSEG systems and do not apply and pay the required meter cost:
- Where any of the other stipulations are not complied with including the following:
    - The system is not rectified to comply with the system requirements.
    - The feed-in (export) exceeds 25% of the installed capacity within any ½ hour period.
    - Where feed-in is not constraint when instructed to do so by the municipality.
    - Quality of supply problems are created on the network impacting close by consumers or the network in general.
- A safety problem is detected possible cased by the SSEG system the supply will be disconnected and such consumer be notified to fix the problem before supply will be restored.
- In all cases thus the following action will be take:
    - The SSEG contravention fee will apply.
    - After a further 2 months the supply could be subject to disconnection after which the standard tariff charges will continue to apply.
- The SSEG contravention fee is set at R4000 and will be subject to annual price increases.

25. STANDARDS

All SSEGs are to comply with the following standards:

1. NRS 097-2-1: *Grid interconnection of embedded generation: Part 2 Small Scale Embedded Generation, Section 1: Utility interface*

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2. NRS 097-2-3: *Grid interconnection of embedded generation: Part 2 Small Scale Embedded Generation, Section 3: Simplified utility connection criteria for low voltage connected generators*

In addition, SSEG installations are to comply with the following standards, legislation and regulations:

1. *South African Renewable Power Plant Grid Code (although the NRS 097-2 series cover most issues relevant to SSEG)*
2. *NRS 048: Electricity Supply – Quality of Supply*
3. *SANS 10142-1, including SANS 10142-1-2: The wiring of premises (as amended and published)*
4. *SANS 474 / NRS 057 : Code of Practice for Electricity Metering*
5. *Municipality Electricity Supply by-law*

The REQUIREMENTS document has specific information regarding compliance with the above standards or specifications.

26. EFFECTIVE DATE OF POLICY

This Policy will become effective from the date of approval by the Municipal Council. Tariffs contemplated within this Policy will be formulated as part of the annual budget approval process and will become effective pursuant to the dates stipulated therein. Consumption Tariffs are subject to NERSA approval.

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