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| **Policy Document** | EThekwini Municipality Small Scale Embedded Generation Policy |
| **Policy Number** | |
| **Policy Review Team** | Electricity Unit |
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# eThekwini Municipality

# Small Scale Embedded Generation (SSEG) Policy

**Preamble**

Large 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 requests to allow electricity customers to connect PV and other Embedded Generators (EGs) to the electricity grid. Such EGs are either directly connected to the distribution grid or are connected to the wiring on the customer's premises which is in turn connected to, and supplied by, the eThekwini Municipality's electricity network. Such generators are hence all considered to be 'embedded' in the municipal grid.

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

## 1. Scope

The purpose of this policy is to:

a) Facilitate the inclusion of Small-Scale Embedded Generation (SSEG) onto the eThekwini electricity distribution network to adequately address safety, power quality, grid operation and municipal revenue.

b) Provide framework for minimum requirements for the approval and registration of SSEG onto the grid such as grid-tied, off-grid, hybrid grid-tied and battery systems.

c) Ensure that all SSEG applications are in alignment with NRS 097-2-3, NRS 097-2-1, South African Grid Codes, National Electricity Regulator of South Africa (NERSA) and AMEU and SALGA standardized approaches and documents.

d) Outline the SSEG requirements such as:

- The conditions under which SSEG will be accepted onto the eThekwini distribution network.
- The application and commissioning process.
- Contractual arrangements between the SSEG customer and eThekwini Municipality.
- Metering and tariffs for SSEG.

e) Provide safe and legal support for all existing SSEG's on the eThekwini area of supply to register their systems.

## 2. Definitions

2.1 **Bi-directional meter-** A meter that separately measures electricity flow in both directions (import and export). Such a meter displays the balance of the imported and exported electrical flow energy in a single register meter (net metering) or displays both imported and exported electrical flow energy in separate registers.

2.2 **Customer-** In the context of this document, customers who also generate will be referred to as "customers" although in fact they are "customer/generators".

2.3 **Municipality-** refers to eThekwini Municipality.

2.4 **Embedded Generator-** An entity that operates one or more generation sources connected to the distribution grid, either directly or behind the customer's meter, that include energy conversion device(s), static power

converter(s), if applicable and the control and protection gear within a customer's network that operates in synchronism with the utility's network.

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

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

2.7 **Reverse power flow-** The flow of energy from the customer electricity installation onto the utility grid because of the instantaneous generation exceeding the instantaneous consumption at the generation site in question.

2.8 **SSEG-** Small Scale Embedded Generation - an embedded generator with a generation capacity of up to 1000 kVA (1MVA).

2.9 **Tariff-** A combination of set financial charge parameters applied to recover measured cost quantities such as consumption and capacity costs as well as service costs.

## 3. Acronyms and abbreviations.

**EG**: Embedded Generation

**ESD**: Electrical Services Department

**IRP**: Integrated Resource Plan

**kVA**: kilo-Volt Ampere (unit of electrical apparent)

**kW:** kilo-Watt (unit of electrical real power)

**kWp**: kilo-Watt peak (the rated peak output of solar PV panels)

**MVA**: Mega-Volt Amperes (1MVA=1000kVA)

## 4. 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.

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 Regulator of South Africa (NERSA) issues electricity generation licenses in terms of the Electricity Regulation Act. Schedule 2 of this act specifies system sizes that must be registered with NERSA, and those that must be licensed by NERSA. This Schedule is updated periodically, and the latest version is applicable and will be enforced by the municipality.

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, centering around, but not limited to, the Grid Code, NRS097-2 series of specifications (for small-scale generators), and the SANS 10142-1-2: *The wiring of premises; Specific requirements for embedded generation installations connected to the low voltage distribution Network in South Africa* (as published and amended).

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

a) The White Paper on Energy Policy (1998).
b) The National Climate Change Response White Paper (2011).
c) 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:

a) White Paper on the Promotion of Renewable Energy and Clean Energy Development (2003).
b) The transition to a green economy.

c) National Carbon mitigation intentions

## 5. Policy principles.

5.1 Customers are not allowed to connect any SSEG to the municipal grid without the written consent of the Municipality. Customers 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 customer fail to have the SSEG disconnected from the grid, the Electricity department reserves the right to disconnect the electricity supply.

5.2 The document '*REQUIREMENTS FOR EMBEDDED GENERATION: Conditions and application process to become an embedded generator in eThekwini Municipality*' (hereinafter 'REQUIREMENTS document') specifies 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.

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

5.4 Customers or developers wishing to install larger generators of 1MVA/MW and above must engage the municipality for guidance on standards, specifications and processes that need to be complied with. Such larger generators fall under conditions and requirements that differ from SSEG.

5.5 Any existing EG systems or applications submitted prior to the adoption of this Policy will have to demonstrate compliance with this Policy through following the procedures specified herein.

5.6 Existing legislation specifies system sizes that need to register with NERSA, and those that require a license from NERSA. This Schedule is updated periodically, and the latest version is applicable and will be enforced by the municipality. Anyone wanting to connect systems within the specified ranges must produce the necessary registration or generating license, or exemption letter from NERSA before they will be given permission to connect their generators to the municipal grid. Should this legislation change, EG customers will be required to comply with the new regulations at their own cost.

5.7 All embedded generation systems installed within the Municipality's grid must be signed off on commissioning by appropriate personnel. SSEG procedures in this regard are defined in the REQUIREMENTS document. Larger generator procedures in this regard will be clarified by the municipality on enquiry.

## 6. Municipal Manager as responsible and accountable officer

6.1 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.

6.2 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.

6.3 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 or other relevant documents to keep up to date with this fast-changing field, with full authority to further delegate any specific responsibility.

## 7. Implementation of Small-Scale Embedded Generation

### 7.1 Application process

7.1.1 All prospective SSEG customers including off-grid and own-use generators are required make an SSEG application.

7.1.2 SSEG customers will be put on to a relevant Net billing tariff structure and a network access charge will be applicable to all SSEG customers.

7.1.3 EThekwini Municipality will evaluate the application according to applicable industry standards and guidelines and other criteria as noted in the REQUIREMENTS document and inform the applicant of the success or unsuccessful outcome of the application.

7.1.4 Should the application not be successful; the applicant will be advised regarding necessary measures to enable compliance with the criteria and SSEG connection.

7.1.5 Further information or technical studies may be requested by the Municipality before a conclusion can be reached.

## 7.2 Commissioning

Approved SSEG systems, once installed, must be commissioned, and signed off by suitable personnel as specified in the REQUIREMENTS document. A Commissioning Report must be provided to EThekwini Municipality.

## 7.3 Metering

All SSEG systems must have approved bi-directional meters installed, as clarified in the REQUIREMENTS document.

## 7.4 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.

## 7.5 SSEG Tariffs

EThekwini Municipality shall implement SSEG tariffs which both cover municipal costs (fixed and variable) for different tariff categories.

## 7.6 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.*
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. *EThekwini Electricity Supply by-law*
6. *Grid Connection Code for Battery Energy Storage Facilities.*

# 8 IMPLEMENTATION OF EMBEDDED GENERATION 1MW AND LARGER

8.1 Generators 1MW and larger need to follow processes different to that of SSEG, as various standards, codes, and procedures relevant to these generators need to be adhered to, including Grid Code compliance and other impact assessments. The GUIDE FOR MUNICIPALITIES ON PROCESSING EMBEDDED GENERATOR APPLICATIONS 1 MW AND LARGER is relevant in such circumstances. Prospective generators falling into this category need to approach the municipality for guide documentation and conditions applicable to them.

## 9. 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 be reviewed and approved annually.