

# Eskom

## Grid-Tied Embedded Generation

### Fact Sheet

Know your  
**electricity**



## Connect your generator to the electricity network - legally and safely<sup>1</sup>

### Introduction

New energy technology solutions in South Africa provide customers the opportunity to redefine their role in the electricity value chain. These solutions include the installation of small generators to generate their own electricity.

Investing in a generator involves a significant financial commitment and therefore requires careful consideration of the following key aspects:

- Compliance to legal and regulatory requirements,
- Compliance to Eskom and the South African Bureau of Standards (SABS) technical and contractual requirements,
- Ensuring the safety of people, assets/buildings, animals and equipment.



### Requirements to register, be exempted from registration or licencing<sup>2</sup>

You will be required to comply with the requirements set out in Schedule 2 Gazette No 43151 of the Electricity Regulation Act (ERA) regarding licensing, registration or to be exempt from registration, for your generation facility. A generation facility means the generation (or distribution facility as applicable) located on your property and comprising all plant, machinery and equipment, all associated buildings and structures (Generator). The following are guidelines but you are advised to confirm with the National Energy Regulator of South Africa (NERSA).

#### 2.1 Generator Exempted From Registration

Under Schedule 2 of the ERA the following activities are exempted from the requirement to be licenced or registered with NERSA:

- The operation of a Generator for the sole purpose of providing standby or back up electricity in the event of an outage, for a duration no longer than the electricity supply interruption.



- The operation of any Generator provided that:
  - o Irrespective of capacity (MW), the Generator does not have a Point of Connection;
  - o If the Generator has a capacity of no more than 100 kilowatts and has an existing Point of Connection, Eskom must keep a register of such facilities and have prescribed the conditions relating to the continued use of the Point of Connection.

#### Explanation

This means that if you have a generator as listed below, they are exempt from requiring licencing or registration with NERSA:

- if you **are not connected** to the grid, and use your generator for standby purposes i.e. own use only or
- your generator of no more than 100kW is connected to the grid and the electricity is for your **own use only** (not supplying other customers). However, because your generator is connected to the grid, you will have to apply for a grid connection, pay the quoted fees and sign the required Eskom agreements. Eskom will also keep a register of all of these systems.

<sup>1</sup> This information applies to Eskom supplied customers. Metro/Municipal customers must consult their supplier.

<sup>2</sup> Disclaimer

Due to changing legislation Eskom accepts no liability whatsoever for any loss or damages and howsoever incurred, or suffered, resulting, or arising, from the use of this information. Information provided is correct at the time of publishing.

## 2.2. Generators Requiring Registration

Schedule 2 of the ERA states the following Generators must be registered with NERSA:

- The operation of a Generator with a capacity of no more than 1MW and a Point of Connection on the distribution power system, in circumstances in which:
  - o the Generator supplies electricity to a customer or related<sup>3</sup> customers with or without wheeling of that electricity; and
  - o the Generator complies with the Grid Code(s) and has entered into a connection agreement with the holder of the distribution licence in respect of the power system over which the electricity is to be wheeled.
- The operation of a Generator for demonstration purposes only (not longer than 36 months),
- The operation of a Generator where the electricity is produced from waste or the residual product of an underlying industrial process,
- The continued operation of an existing Generator which, immediately prior to the date of commencement of this Schedule, was exempt from the requirement to apply for and hold a licence under the Act.

### Explanation

This means that any Generator of 1MW or less, that is grid-tied (whether exporting energy into the grid or not) **and supplying** a customer or related customer(s) (even 100 kW and below), will have to be registered with NERSA.

NERSA will require information from Eskom to ensure that a grid connection is possible and there will need to be an application by the customer to be grid-tied, the quoted fees to be paid and the required agreements to be signed.

## 2.3. Generator Requiring Licencing

Any Generator:

- Above 1MW,
- supplying more than one non related party, irrespective of size will require licencing.

*Exceptions:*

- A generator above 1MW used for demonstration purposes for no longer than 36 months,
- a generator producing electricity from waste heat.

## Generator network configurations

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Carefully consider what Generator configuration to install, as this influences the legal, regulatory, technology standards, tariffs and metering equipment requirements. The following Eskom configurations are available:

### 3.1. An off-grid system

An off-grid system is one where there is no electrical tie that links the Generator with the Eskom grid. The Generator is therefore not grid-tied (not electrically connected to the Eskom grid) and does not need an Eskom supply to work. This type of installation does not require authorisation from Eskom and this installation does not need to be registered with NERSA.

### 3.2. A Standby Generator

A Standby Generator configuration may or may not be grid-tied.

For a grid-tied standby Generator, an application will be required to be made to Eskom to authorise the Generator.

A Generator that is not grid-tied (not electri-

cally connected to the Eskom grid) and does not need an Eskom supply to work, does not require authorisation from Eskom.

In both cases, the Standby Generator does not need to be registered with NERSA subject to it only being used for periods of electricity supply interruptions.

### 3.3. Installations designed to consume all the power generated (non-export)

This Generator configuration is one that is electrically connected to the Eskom grid (is grid-tied) and provides electricity to the customer's property when required and is designed such that no energy is exported into the Eskom grid.

As the generator configuration is grid-tied, even if there is no export of energy into the Eskom grid, it requires Eskom authorisation. Depending on the criteria set out in Schedule 2, the generator will either be exempted from registration, require registration or licencing.

Eskom authorisation includes an application, payment of fees and signing new contracts covering the tariff, legal, regulatory and technical requirements.

The Eskom connection and use-of-system agreement will specify a maximum export capacity (MEC) of zero kW. No tariff charges will be applicable, but there may be costs related to the connection to the grid. Any export will constitute a breach of the agreement concluded with Eskom and the supply may be disconnected.



<sup>3</sup>"Related customers" means customers which are related and inter-related to each other within the meaning contemplated in section 2 of the Companies Act, 2008 (Act No.71 of 2008);

### 3.4. Installations designed to export power into the grid

In this configuration not all the electricity is used at the installation and some or all of it is exported into the grid for the purposes of getting an energy offset credit on the account or for wheeling the energy to another customer so they can get an energy offset credit on their account.

This type of Generator connection requires Eskom authorisation and depending on the criteria set out in Schedule 2, will either be exempted from registration, require registration or licencing.

Eskom authorisation includes application, payment of fees and signing new contracts covering the tariff, legal, regulatory and technical requirements. The Eskom connection and use-of-system agreement will specify a maximum energy export capacity in the Eskom grid as determined by the customer. Tariff charges may be applicable for the exported energy, and there may be costs related to connection to the grid.

## Requirements to legally and safely connect a generator to the grid



In order to get permission to be connected (be authorised by Eskom), you will be required to apply for a grid connection, pay the required fees and

sign a connection and use-of-system agreement. The grid connection must be technically possible and must be in compliance to Schedule 2 of the ERA, various Grid Code(s), Eskom technical standards and the SABS national standards (SANS), also govern the safe grid connection. Generator connections must comply with the most recent editions of the documents listed on Eskom's website.

As part of the Eskom technical requirements, a professionally registered competent person will complete the "embedded generation installation (EGI) compliance test report" which forms part of the Customer's connection and use of system agreement. A copy of this report can be found on the Eskom website. The connection and use-of-system agreement will be updated with the publication and commercial implementation of SANS 10142-1-2:201X by the SABS, covering the wiring of premises with the specific requirements for embedded generation installations connected to the low voltage distribution network in South Africa.

Eskom has a legal responsibility to ensure the safety of the network, field staff and the public at large, and it is for this reason that the technical requirements must be complied with.

## Tariff Options



Eskom has a selection of tariffs that are applicable depending on the installation. Eskom's tariff information and tariff tools are to be found on the website [www.eskom.co.za/tariffs](http://www.eskom.co.za/tariffs).

### 5.1. Grid tied generation, with no exported power into the grid.

- Customers must be on a time of use (TOU) tariff or convert to the relevant TOU tariff when installing embedded generation.
- Eskom tariffs applicable are Megaflex and Miniflex (Urban or >22 kV connection), Ruraflex (Rural) or Homeflex<sup>4</sup>. These tariffs charge for consumption using different charges for different TOU periods.

Where a change of tariff is required a new supply agreement will be needed in addition to a connection and use-of-system for the generator connection.

### 5.2. Grid tied generation with exported energy.

- Customers must be on a time of use (TOU) tariff or convert to the relevant TOU tariff when installing embedded generation.
- Eskom tariffs for consumption are Megaflex and Miniflex (Urban or >22 kV connection), Ruraflex (Rural) or Homeflex<sup>4</sup> (These tariffs charge for consumption using different charges for different TOU periods.
- Tariffs for generator export are Gen DUoS, Megaflex Gen or Ruraflex Gen.



<sup>4</sup>Future residential TOU tariff to be approved by Nersa, to be mandatory for grid-tied embedded generation.

Where a change of tariff is required a new supply agreement will be needed in addition to a connection and use-of-system agreement for the generator connection.

### 5.3. Compensation for energy into the grid exported

- A. If there is exported energy into the grid and this energy is not wheeled to another Eskom customer, then Eskom will compensate (credit) the customer for this energy at the Gen-offset tariff.

An amendment to the electricity supply agreement is required to provide this offset credit.

- B. If there is exported energy into the grid and this energy is wheeled to another Eskom customer or point of delivery (the off-taker).

This arrangement is also called “wheeling”. Eskom will credit the off-taker of the energy for non-Eskom energy at the Gen-wheeling tariff rates.

An amendment to the electricity supply agreement is required to provide this wheeled credit.

Note that wheeling is not available for customer connected generators connected at low voltage.

All of the above are subject to either exemption from registration, or registration or licencing as the case may be, by NERSA.

All of the above are billed on a monthly basis.

Eskom, subject to the Eskom Energy Banking policy, may also allow banking (carry-over of energy produced but not consumed to the next month) by the user/buyer of the energy when there is an offset or wheeling transaction.

### 5.4. For customers on a pre-paid supply.

Eskom’s prepaid meters and metering system is not currently able to do time-of-use and export energy. Customers with prepayment meters will therefore have to convert to billed metering with the appropriate TOU tariff.

## Cost to be grid-tied

Before an installation can connect, an application must be made to Eskom (see Point 9 Application process). Standard application forms are available and they must be completed. Eskom will then issue a quote, providing the connection charges to be paid.

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The connection charge will typically cover:

- A quotation fee.
- Metering changes.
- Any network upgrades that may be required.

The quote must be accepted, the charges paid and the relevant agreements must be signed, before Eskom will initiate any work to authorise the connection.

## Agreements to be signed

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The following agreements may be required:

- A new electricity supply agreement if the existing agreement is old or if there is a tariff conversion or changes to the supply.
- Amendments to the electricity supply agreement to enable offset or wheeling or energy banking.
- A connection and use-of-system agreement setting out the conditions and obligations for the generator connection.

## Metering requirements

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For all installations Eskom will install bi-directional 4-quadrant meters that measure the electricity used and exported energy separately in half hourly intervals.

Meters are not allowed to turn-backwards (reverse). Meters found to be reversing will constitute an illegal installation and will be dealt with as such. Meter replacement costs may be given with the quotation.

## Application process

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Consult the Eskom website to determine if your installation type is supported by Eskom. If allowed, complete the Eskom application form provided on the website.

<https://www.eskom.co.za/CustomerCare/NewSupply/Pages/GeneratorConnect.aspx>

Register/license with NERSA after Eskom has provided a letter for the grid connection (<http://www.nersa.org.za/>).

## Illegal generator connections

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Eskom requires that the customer's unauthorised grid-tied generator be disconnected and isolated from the grid to avoid supply disconnection. The disconnection is to ensure that the safety of staff and people in general at the Eskom point of supply is not compromised.

Unauthorised grid-tied generators, which are operational, can endanger the lives of the Metro/Municipal and Eskom operating staff and the public, and can compromise the quality of electricity supply.

If any incident occurs, whether it involves loss of life, physical harm or damage to any equipment, the owner of the unauthorised grid-tied generator will be financially and legally liable for all damages incurred or for the loss of life. Grid-tied generators that have not been given permission for a grid-tie is also a breach of legislation and of the Eskom's supply agreement.

Once the connection has been found to be unauthorised, the owner of the generator will receive a letter stating that the

connection is illegal. Eskom reserves the right to disconnect the supply immediately if remedial action is not taken. Eskom has to disconnect any unsafe installations found. Failure to comply will result in reconnection fee charges together with the disconnection of the main supply. Eskom will also raise charges to recover lost revenue, the associated costs incurred for meter replacement (i.e. bi-directional meter) or meter reprogramming and these charges will be recovered from the customer.

Moreover, failure to follow the prescribed application and registration process constitutes a statutory offence and Eskom will consider the entire installation to be unauthorised and request that the generator be disconnected until the process has been completed.

## Contact us

If you are interested in installing a generator that will be grid-tied, please contact Eskom on **08600 37566** to arrange for assistance.

