NATIONAL ENERGY REGULATOR OF SOUTH AFRICA

Consultation Paper

Small-Scale Embedded Generation: Regulatory Rules

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Definitions

Administration charge	The administration charge covers the costs of the administration of the account. It is a contribution towards fixed costs such as meter reading, billing and meter capital. It is a fixed charge payable every month whether electricity is consumed or not**.**
Bi-directional meter	The bidirectional meter is a meter that is installed for Net Metering customers and records the power flowing in two directions. It measures how much electricity customers use from the embedded generation and how much electricity the utility system supplies to the customer with an embedded generator.
Bi-directional distribution rate	The concept of bi-directional distribution rate is that the customer taking power from the grid needs the grid in order to have reliable service, and should pay the same rate as other customers. This same customer, however, also 'needs' the grid when he or she is in an exporting condition, and pays the same distribution charge when feeding power to the grid.

Customer	Means electricity customer.
Distributed Generation	Distributed generation is defined as the installation and operation of electric power generation units connected directly to the distribution network or connected to the network on the customer site of the meter
Distribution Grid code	A code of practice that sets minimum technical requirements applicable to all participants operating or connected to the Distribution System as approved by NERSA.
Embedded Customer	A customer whose supply is taken from the distribution system.
Embedded Generator	An entity that operates one or more units that is connected to the Distribution System. Alternatively, a legal entity that desires to connect one or more units to the Distribution System.
Export tariff	A payment for every kilowatt-hour (kWh) of surplus electricity a customer system exports to the electricity grid.

Feed-in tariff	An administrative tariff or standard offer approved by the Energy Regulator for a renewable energy generator or energy efficiency interventions.
Integrated Resource Plan 2010	In terms of the Electricity Regulation Act of 2006, it means a resource plan established by the national sphere of government to give effect to national policy. It refers to the coordinated schedule of generation expansion and demand-side intervention programmes, taking into account multiple criteria to meet the electricity demand.
Generator	A legal entity licensed to engage in the production of electricity through a unit or power station.
Genflex	A new tariff category proposed by Eskom for customers that are consuming and generating energy at the same point of supply.
Import tariff	A payment for every kilowatt-hour (kWh) of electricity imported to a customer system from the electricity grid.

Licensed Distributor	Reference is made to the 'licensed electricity distribution authority'. In South Africa, this may be Eskom, or the municipal electricity service provider.
Megawatt	A unit of power equal to one million watts.
Net-metering	Net-metering is a service to an electric consumer under which electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset electric energy provided by the electric utility to the electric consumer during the applicable billing period.
Network charges	The network charge is a tariff charge payable per premise every month. The network charge recovers network costs (including capital, operations, maintenance and refurbishment) associated with the provision of the network capacity required and reserved by the customer. The network charge in the retail tariff or in the Distribution use of system charges may or may not be the same in structure and value.

Network Service Provider	A legal entity that is licensed to provide network services through the ownership and maintenance of an electricity network.
Reactive Power	Reactive power is produced when the current waveform is out of phase with the voltage waveform due to inductive or capacitive loads.
Participant	In this document, it means the Embedded Generator.
Reliability service charges	The charge for services provided by the network service provider to ensure short-term reliability to customers.
Renewable Energy Grid code	Grid Connection Code for Renewable Energy Power plants connected to the Transmission System or Distribution System in South Africa.
System Operator	The legal entity licensed to be responsible for short-term reliability of the Integrated Power System (IPS), which is in charge of controlling and operating the Transmission system and dispatching generation (or

	balancing the supply and demand) in real time.
SSEG	Small-Scale Embedded Generation in this document is referred to as Solar PV generation
Tariff	A tariff is a combination of charging parameters applied to recover measured quantities such as consumption and capacity costs, as well as unmeasured quantities such as service costs
Time of Use	The time of day, or season during which electricity is used.
Time-of-Use tariff	A tariff with energy charges that change during time-of-use periods and seasons.
Wholesale Electricity Pricing System	A totally unbundled, cost-reflective tariff structure.

ACRONYMS AND ABBREVIATIONS

CSP	Concentrated Solar Power
CPPA	Central Power Purchasing Agency
DC	Direct Current
DG	Distributed Generation
DoE	Department of Energy
DUOS	Distribution Use of Systems
EIA	Environmental Impact Assessment
EG	Embedded Generation
FIT	Feed in Tariff
GWh	Gigawatt hours
IPP	Independent Power Producer
IRP	Integrated Resource Plan
LCOE	Levelised Cost of Energy
LV	Low Voltage
MV	Medium Voltage
MW	Megawatt
NEM	Net Energy Metering
NERSA	National Energy Regulator
NIPS	National Integrated Power Systems
NMD	Notified Maximum Demand
NRS	National Rationalised Specifications
OCGT	Open Cycle Gas Turbines
PPA	Power Purchase Agreement
PUC	Point of Utility Connection
PV	Photovoltaic
RE	Renewable Energy
REEEP	Renewable Energy Efficiency Programme
REFIT	Renewable Energy Feed-In Tariff

REGC	Renewable Energy Grid Code
REIPP	Renewable Energy Independent Power Producer
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
REFSO	Renewable Energy Finance and Subsidy Office
RPP	Renewable Power Plant
SMME	Small Medium and Micro Enterprises
SSREG	Small-Scale Renewable Embedded Generation/Generator
SSPVEG	Small-Scale Photovoltaic Embedded Generation
SWH	Solar Water Heater
TOU	Time-of-Use
WEPS	Wholesale Electricity Pricing System

1 THE CONSULTATION PROCESS

The National Energy Regulator (NERSA) is in the process of drafting the Small-Scale Embedded Generation: Regulatory Rules. However, prior to the decision, the Energy Regulator will embark on a due process involving stakeholder consultations. As part of this process, NERSA is requesting that stakeholders comment on the issues raised in this consultation paper. The consultation paper is broken down into sections relating to the key elements/components that make up the Small-Scale Embedded Generation. Each section provides the draft rules followed by questions to stakeholders for comments.

NERSA will collate all comments received, which will be taken into consideration when the decision is made. NERSA will also hold a public hearing in April 2015 wherein presentations may be made by interested and affected parties. The process for the consultation and decision-making is outlined in the table below:

DRAFT HIGH-LEVEL TIMELINES FOR APPROVAL OF THE SMALL-SCALE EMBEDDED GENERATION REGULATORY RULES	
ACTIVITY/TASK	**DATE**
Publication of notice of consultation paper for stakeholder comments on Small-Scale Embedded Generation: Regulatory Rules	25 FEBRUARY 2015
Closing date for stakeholder comments on Small-Scale Embedded Generation: Regulatory Rules	25 MARCH 2015
Public Hearing	10 APRIL 2015[1]
Energy Regulator decision on the Small-Scale Embedded Generation: Regulatory Rules	22 MAY 2015
Publication of the Small-Scale Embedded Generation: Regulatory Rules on the NERSA website	30 MAY 2015

Stakeholders are requested to comment in writing on the Small-Scale Embedded Generation: Regulatory Rules Consultation Paper. Written comments can be

[1] Details regarding logistics (venue, time, etc.) will be communicated in due course.

forwarded to embeddedgeneration@nersa.org.za; hand-delivered to Kulawula House, 526 Madiba Street, Arcadia, Pretoria, or posted to PO Box 40343, Arcadia, 0083, Pretoria, South Africa. The closing date for the submission of comments is 25 March 2015 at 16:00.

For more information and queries on the above, please contact Mr Moefi Moroeng or Mr Lucky Ngidi at the National Energy Regulator of South Africa, Kulawula House, 526 Madiba (formerly Vermeulen) Street, Arcadia, Pretoria.

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2 INTRODUCTION

The Electricity Regulation Act, 2006 (Act No. 4 of 2006) ('the Act') mandates the National Energy Regulator (NERSA) to, among other things, regulate prices and tariffs, and issue licences for electricity Generation, Transmission, Distribution, exports and imports, and trading activities. Electricity generation and reselling falls under trading activities (buying and selling of electricity), however, unlike all other activities that are licensed, these supplies which are below 1MVA remains unregulated (non-licensed and/or unregistered).

The National Energy Regulator Act, 2004 (Act No. 40 of 2004) serves as the establishing legislation of the Energy Regulator and promotes the protection of the interests of vulnerable groups within the Electricity Supply Industry (ESI).

Based on NERSA research and analysis, Solar Photovoltaic (PV) has a bigger demand in South Africa at the moment than other technologies. This has necessitated NERSA to focus on all small-scale embedded PV generation. An urgent and proper Regulatory rules for small-scale embedded PV generation is recommended and a two-phase approach for the introduction of standardised tariff schemes for them be considered in South Africa.

In the short term, this consultation will be focusing on the regulatory rules for a modified net-metering scheme (or net-billing scheme) with different tariffs for exporting and importing energy for small-scale embedded generation up to 1MVA of installed capacity. The regulatory rules will define the basic principles and mechanisms for such a scheme. Such a net-metering (or net-billing) scheme could be implemented in the short term, within the responsibilities of the individual distributors.

During a second phase, more complex structures for handling fees, subsidies, levies and taxes, e.g. involving a Central Power Purchasing Agency and/or

introducing compensation schemes for municipalities, could be put in place. Such a scheme would need policy commitment and a specification of IRP targets of South Africa with respect to the use of Small-Scale Energy Generation (SSEG) (which are not defined at present). This process should be accompanied by studies about the cost impact of SSEG. In particular, avoided cost of municipalities, avoided cost of generation from a national perspective etc. should be considered as there are significant potential benefits of SSEG from an overall economic perspective. By doing so, the focus would shift away from just looking at the impact on revenues of municipalities but towards a broader national point of view. This would also allow to define a fair compensation schemes that may be needed once penetration rates of SSEG reach significant levels.

3 BACKGROUND

To date, South Africa's renewable energy policy of 2003 has largely been driven by a 10,000GWh target by 2013 and renewable energy project subsidies offered through the Renewable Energy Finance and Subsidy Office (REFSO). From 2009 to 2011, a Renewable Energy Feed-In Tariff (REFIT) was considered and published, which resulted in great interest by Independent Power Producers (IPPs) to develop renewable energy projects in South Africa. However, due to legislative constraints in 2011, a competitive procurement process entitled the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) was launched by the Department of Energy (DoE) in its place.

In terms of section 34 of the Electricity Regulation Act, 2006 (Act No. 4 of 2006) ('the Act'), the Minister has determined that 3,725 megawatts (MW) to be generated from Renewable Energy sources is required to ensure the continued uninterrupted supply of electricity. This 3,725MW is broadly in accordance with the capacity allocated to Renewable Energy generation in the Integrated Resource Plan 2010–2030 (IRP 2010). This IPP Procurement Programme has been

designed to contribute towards the target of 3,725MW and towards socio-economic and environmentally sustainable growth, and to start and stimulate the renewable industry in South Africa.

REIPPPP only made provision for large and small-scale solar photovoltaic greater than 5MW and 1MW respectively, which effectively excludes most rooftop systems. In spite of this, the past year has seen a great increase in the number of private rooftop PV systems installed on residential and commercial/industrial premises at the cost of the owners. Ostensibly for generating electricity for own use, these systems are nonetheless grid tied, and could be capable of feeding surplus power back into the grid. A number of residential rooftop grid tied PV systems have also come to light, using net-metering by agreement with the relevant municipalities. Several municipalities have drawn up procedures for connecting such systems, and NERSA has also produced documents covering such situations. So it would seem that in spite of exclusion from the large-scale REIPPPP, privately installed small-scale grid tied rooftop solar is alive and well and growing in South Africa.

The IRP 2010–30 Update [2] states that 9,770MW of solar PV capacity is planned to be installed in South Africa by 2030. The IRP 2010–30 Update also estimates that Embedded Generation (EG) residential and commercial PV could reach 22.5GW by 2030 based on *Living Standards Measure 7* (LSM 7) households and 5kWp PV household installations [2]. Even if this estimate is partially correct, this points to a significant level of installed Small-Scale Solar PV Embedded Generation (SSPVEG) capacity in South Africa by 2030.

1. The South African IRP 2010, approved and published in May 2011 by the DoE, outlines the proposed power generation mix for South Africa. The IRP 2010 seeks to increase the overall contribution of new renewable energy generation to 17,800MW by 2030 (42% of all new-build generation).

2. Based on the approved IRP 2010, on 02 July 2011, the Minister of Energy issued a Determination for the IPP procurement programme in accordance with section 34(1) of the Electricity Regulation Act, 2006.

3. The Energy Regulator concurred with the Ministerial Determination on 07 July 2011.

4. On 19 December 2012, the Minister of Energy made a new determination for the procurement of an additional 3,200MW capacity to the previous determination of 3,725MW. The total capacity to be procured is currently 6,925MW.

The new capacity allocation is as follows:

Table 1: New capacity allocation

Technology	**Capacity (MW)**
Onshore wind	3 320
Solar photovoltaic (PV)	2 525
Concentrated Solar Power (CSP)	600
Small hydro (≤ 40MW)	135
Landfill gas	25
Biomass	60
Small projects	200

4 PURPOSE

The principal aim of this Consultation Paper on the regulatory rules for small-scale embedded generation is to:

(a) solicit comments from stakeholders on the proposed regulatory rules for small-scale embedded generation; and

(b) explore various tariff options available in promoting and incentivising installations that are grid-tied.

5 APPLICABLE LAW

Electricity Regulation Act of 2006

The Electricity Regulation Act, 2006 (Act No. 4 of 2006) ('the Act') stipulates that no person may operate a generation facility without a licence from the Energy Regulator, except for activities listed on Schedule 2 of the Act, namely:

1 *Any generation plant constructed and operated for demonstration purposes only and not connected to an inter connected power supply*
2 *Any generation plant constructed and operated for own use*
3 *Non-grid connected supply of electricity except for commercial use*

The small-scale embedded generators that are connected to the grid and operated for commercial purposes must therefore be licensed or registered by the Energy Regulator. Even zero or net consumption customers must be licensed or registered, due to connection to the grid.

Section 10 of the Act details the information that should be included in an application for licensing of a generation plant. Section 11 of the same Act requires that once an application for a licence is made, the applicant must publish a notice of the application in appropriate newspapers or other appropriate media circulating in the area of the proposed activity in at least two official languages. The advertisement must state:

a) the name of the applicant;
b) the objectives of the applicant;
c) the place where the application will be available for inspection by any member of the public;

d) the period within which any objections to the issue of the licence may be lodged with the Regulator;

e) the address of the Regulator where any objections may be lodged;

f) that objections must be substantiated by way of an affidavit or solemn declaration; and

g) *such other particulars as may be prescribed*.

Due to the envisaged high volumes of solar rooftop installations, the licensing of small-scale embedded PV generators using the above process may be a burden to the applicants who have little resources and may put constraints on NERSA. In view of the above it may be prudent to register small-scale embedded PV generators instead of being licensed.

Registration of small-scale renewable energy projects is not new to South Africa. In 2011, NERSA approved the *Standard Conditions for Embedded Generation within Municipal Boundaries* where embedded generators up to 100kW are registered by the municipalities and allowed to sell power to municipalities. However, the document was approved without due public consultations and is not clear to most stakeholders. Stakeholders are of the view that the cut-off point of 100kW is too small for most proposed small-scale embedded generators. Furthermore, the current renewable energy procurement programmes do not cover projects less than 1MW. Small-scale renewable energy projects from 1MW to 5MW will be procured by DoE under Small-Scale Renewable Energy Programme while large-scale projects (more than 5MW) are procured by DoE under the Renewable Energy Bidding Programme (REBID). This leaves projects between 100kW and 1MW with no legal framework for implementation. It is therefore proposed that the *Standard Conditions for Embedded Generation within Municipal Boundaries* that was approved in 2011 be replaced by this document once approved.

6 PROPOSED REGISTRATION PROCESS OF SMALL-SCALE EMBEDDED GENERATION

Under this document, it is proposed that projects less than 1MW be registered by the Energy Regulator. To ensure a seamless interconnection with the network service provider, it is proposed that the embedded generator will submit an application to the licensed distributor, who will assess the status of its network to determine its technical capacity to accommodate the new generator. The licensed distributors will then be responsible for designing and maintaining the application forms to be used by prospective embedded generators.

Once the application is accepted, the licensed distributor will maintain the database of the generators and on a monthly basis, submit that database to NERSA for registration. NERSA would require the following minimum information for registration:

i. customer name and account number
ii. the technology of the generator;
iii. the installed capacity;
iv. its location (both of the network and GPS);
v. whether there is energy storage associated with it;
vi. customer's average annual energy consumption (without embedded generation);
vii. average annual import from the grid after installation of the generator;
viii. expected annual energy export to the grid after installation of the generator;
ix. technical studies and report on how much the network can take on these installations.

Stakeholder comment # 1:

I. Stakeholders are requested to comment on the proposed registration as opposed to licensing.

II. Stakeholders are further requested to comment on the adequacy of the required minimum information. If not, kindly list additional information that you would like on the NERSA registration database given that such aggregated information would be published for research purposes.

7 REPORTING REQUIREMENTS OF THE DISTRIBUTING UTILITIES TO NERSA

It is proposed that the licensed distributors report to the Energy Regulator on an annual basis on the following Information:

i. the number of installations;
ii. the total capacity installed;
iii. the total energy generated to the system in each 'Time-of-Use tariff' metered time period;
iv. complaints received from customers on the same circuit as the generation about quality of supply;
v. all safety related incidents involving generation;
vi. the tariffs applicable to these installations; and
vii. the Standard Supply Agreement.

Stakeholder Comment # 2:
The stakeholders are requested to comment on the adequacy and confidentiality of information required from licensed Distributors.

8 GRID INTERCONNECTION STANDARDS FOR SMALL-SCALE EMBEDDED GENERATION

There are currently no approved mandatory standards to govern the SSEG in South Africa, however there is a series of specifications (NRS 097 series) that shall

be used to facilitate the interconnection of the SSEG to the distribution network. It must be noted that this NRS 097 series is currently not complete and does not adequately cover all the technical aspects of grid interconnection of the SSEG. Once the series is complete, some parts of it will be converted to into a Renewable Energy Grid Code (REGC) and adopted as part of a licence condition to the distributors.

In the absence of the approved standards for SSEG interconnection with the network, the conditions for grid connection of embedded PV generators shall follow the requirements prescribed by NRS 097-2-1:2010 and NRS 097-2-3:2014 which at present among others pertains to the following aspects:

a) Direct current injection
b) Point of isolation of the embedded generation
c) Quality of Supply threshold for the embedded generation
d) Size of the small-scale embedded generation and other operation principle also covered by the REGC under the codes.

Stakeholder Comment # 3: *Stakeholders are requested to comment on appropriateness of connection of SSEG to the grid in the absence of relevant approved standards.*

9 INVERTERS FOR THE SMALL-SCALE EMBEDDED GENERATION

The compliance with the REGC and the NRS 097 series requirements dictates that the SSEG inverters need to be type tested to certify that their operations complies with these stipulations. There are no type testing or SANAS approved testing houses for inverters in South Africa at the moment. An alternative way needs to be developed to ensure that technically performing inverters are employed in the

absence of inverter standards and testing houses. Inverters are an important component of SSEG and their optimum performance is equally important.

Stakeholder Comment # 4: *In the absence of a SANAS approved test house, is self-certification of products by local manufactures acceptable?*

10 CODES OF PRACTICE ON SMALL-SCALE EMBEDDED GENERATORS

10.1 Grid Connection Requirements

The Renewable Energy Grid Code requires that if the generators are going to be grid tied, they must be willing to undergo technical compliance tests of the applicable, to ensure good quality of supply as well as safe and sustainable operation of the network.

Stakeholder Comment # 5: *Stakeholders are requested to comment on current grid code relevancy for SSEG regarding testing of compliance to the technical requirements e.g. reactive power support, low or high voltage ride through etc. To what level can these generators be tested for technical compliance?*

10.2 Power Quality and Limitation of Liability

Intermittent generators produce some transients (reactive power and current, voltage dips and swells, power factor etc.) and these can be injected into the network and they may prove to be harmful at some point. The Grid Code currently has some requirements in place for renewable energy generators under reactive power, power quality, frequency response etc.

Stakeholder Comment # 6:
Stakeholders are requested to comment on whether the monitoring of these transients are to be done by the generator as well as the network owner. How is limitation of liability going to apply?

10.3 Technical Performance

The utilities/network owners will have a certain level of expectations with regard to the technical performance requirements of the small-scale embedded generation technology to be installed. The Grid Code also has requirements in place for expected technical performance of the plants

Stakeholder Comment # 7:
Stakeholders are requested to comment on the relevant expectations of the network owners with regard to the performance requirements of the SSEG technology to be installed as per the grid code requirements.

10.4 Information Exchange Protocols

According to the Information Exchange Code, there needs to be communication protocols with the participants who are involved or connected to the network. The code outlines some rules on communication protocols between the distributor and generator etc.

Stakeholder Comment # 9:
Stakeholders are requested to comment on the rules on communication protocols between the SSEG and the network owners/Utilities or the relationship based on what the grid code currently requires own metering points and billing.

10.5 Signals, Communication and Control Functions

More advanced functions, some of which may require communication capability (between inverter and utility) must be considered. Examples of such functions are: limiting maximum active power upon instruction from the utility, supporting instructions to connect/disconnect, ability to update default settings in response to changing grid conditions, etc.

Stakeholder Comment #10: *Stakeholders are requested to comment on the compliance of these types of generators in terms of such requirements, where they will need to have a remote control capability to do this if the network owner does not have access to this capability.*

11 TARIFF DESIGN

As the penetration of SSEG grows, pricing and tariffs together with the regulatory policies need to be in place. These pricing/tariffs and regulatory policies need to ensure that the utility can collect enough revenue to cover its cost of supply and continue to safely and reliably provide electricity services to all its customers.

Most tariffs for residential and small customers are not cost-reflective as they do not reflect the fixed costs associated with the management, operations and maintenance of the grid and the retail-related costs to serve these customers. If the electricity tariff supplying a customer is not cost reflective and own generation is installed, it means that there will be a loss of revenue to the network service provider that needs to be recovered from other customers as there is no commensurate reduction in costs. Many tariffs comprise variable c/kWh only charges and no or limited fixed charges removing fixed costs. This means that if consumption decreases due to own generation, the distributor loses revenue that is not commensurate with a reduction of costs.

11.1 Revenue impact on distributors

From the utility's perspective, revenue loss is a concern. SSEG reduces the utility's sales and the revenue, but also avoids some costs such as energy purchase costs.

The Energy Regulator needs to consider mechanisms for facilitating the development of the SSEG in South Africa while mitigating a potential negative impact on the utility's revenue.

The main issues for a utility related to the connection of SSEG installations are:

i. SSEG causes a reduction in sales and where tariffs are not structured to recover all fixed costs through fixed charges, there will be a negative revenue impact due to the loss in sales.
ii. Customers may be net zero consumption customers, but still need the grid a backup of variable energy resource.
iii. Even though consumption might be lower or even zero, customers may still require the infrastructure to draw the same demand affecting the grid and generation capacity as customers that that do not have own generation – typically those installing PV.
iv. There remains a cost to connect and use the grid as a backup and to consume when needed.
v. This cost is not recovered if fixed charges are not cost-reflective and there a net-metering/billing or net-FIT tariff scheme.
vi. It constitutes variable avoided cost of supply (fuel and variable operating costs).
vii. Most tariffs for residential and small customers do not have cost-reflective network charges.
viii. Customers that do not have SSEG could subsidise the tariffs of customers with SSEG – unless the consumption tariffs and the export credit tariff are made cost-reflective.

ix. The customer should be aware that they will not be getting a credit based on current tariffs – the credit should be related to the total utility's avoided costs.

x. The customer's avoided cost could therefore only be related to costs that are avoided by embedded generation and this needs to be factored in by the customer when investing in such equipment.

As SSEG reduces the utility's energy purchase costs, energy sales and revenues, the Energy Regulator needs to consider mechanisms of dealing with the impact of SSEG. The impact on revenue to the utility should be mitigated through an SSEG net-billing tariff for both export (generation) and import (consumption) design. This can be managed through the appropriate tariff structures for both export and import of energy that will ensure a fair recovery of revenue for all parties, the distributor, customers with SSEG and those without SSEG.

The various components of the tariff structure that must be considered for both the import and export credit tariff (under a net-metering scheme) are as follows:

11.1.1 Fixed network costs

It must be ensured that the fixed costs associated with maintaining and operating the network are recovered through appropriate fixed charges. These costs may even increase due to SSEG and the network needs to manage bi-directional flow and the peak demand is not necessarily reduced.

Stakeholder comment #11 *Stakeholders are requested to comment on the fixed network costs to protect the distributors against revenue losses.*

11.1.2 Fixed retail (service and administration) costs

It must be ensured that the fixed costs associated with providing a retail service (metering, billing, customer call centre) network are recovered through appropriate fixed charges. These costs may even increase due to SSEG.

Stakeholder comment #12:
I. Stakeholders are requested to comment on the service and administration charges for SSEG.

11.1.3 Ancillary services costs

Ancillary service costs cover the cost of the system operator to keep the system whole and balanced including all customer's consumption and generation.

Stakeholder comment #13:
Stakeholders are requested to comment on the proposed approach to recovering the cost of ancillary services from traders and retailers.

11.1.4 Variable costs

Variable costs are costs associated the amount of consumption of energy such as the generation of electricity and line losses and these costs are not treated as fixed (even though there might be fixed cost components).

11.1.5 Connection and metering cost

There may be incremental costs associated with the grid connection, as well as if metering has to be changed. Such incremental costs are payable by the customer through a connection charge

Stakeholder comment #14:
Stakeholders are requested to comment on the appropriateness of connection and metering charges for SSEG.

11.2 Avoided costs

The SSEG might avoid certain costs for a distributor and should be fully compensated through an export credit rate for any measurable reduction of cost to the utility. This would be the avoided energy cost/purchases, and, if any, the network and line losses costs.

As more and more SSEG is connected its possible, however, that SSEG could increase the costs of the network and line losses.

Stakeholder comment #15:
Stakeholders are requested to comment on the proposed approach used for dealing with avoided costs. Please provide other alternatives, if any.

11.3 Tariff charge components for consumption

Distributors recover their costs through typically the following tariff charges:

a. Variable (c/kWh)
    - Energy charges to recover energy cost (cost of energy purchases)
    - Losses
    - Reliability service charges to recover ancillary service costs
b. Fixed (R/day or R/kVA – based on capacity)
    - Network charges to recover network capital, maintenance, returns and operating costs

- Service and administration charges to recover the retail costs associated with billing, meter reading and customer service

c. Other
   - Connection charges to recover incremental metering and network related costs (once off)
   - Charges related to the contribution to subsidies (could be fixed or variable)

Stakeholder comment #16: *Stakeholders are requested to comment on the appropriateness of the aforementioned method of tariff design. Please provide alternative methodologies, if any.*

11.4 SSEG net-billing tariffs

The customer would receive a multipart bill with NERSA-approved:

- charges for consumption, use of the grid and retail services:
  - fixed charge based on the installed capacity (use of system charges, admin costs),
  - a set tariff for net-import of electricity or optionally a TOU tariff; and
- an export credit rates tariff for any net-export of electricity.

Stakeholder comment #17: Stakeholders are requested to comment on the appropriateness and the relevance of the aforementioned tariff method.

11.4.1 Consumption tariff for SSEG

Customer consumption tariff = Fixed charges + Variable charges.

Fixed Charges (R/day charge based on NMD) = Network charge + service and administration charge)

Variable charge (R/kWh) = Variable energy consumption charge + ancillary/reliability service charge based on all energy consumed.

- The distributor may motivate to recover some network costs through a variable charge to minimise the impact on the customer with SSEG and to facilitate a legal connection to the grid.
- The variable energy charges may be a single energy charge or Time-of-Use (TOU) if TOU metering is available and the distributor has NERSA approved TOU charges

Stakeholder comment #18: *Stakeholders are requested to comment on the appropriateness and the relevance of the aforementioned tariff method.*

11.4.2 Export credit tariff for generated exported energy

The SSEG shall be compensated for own energy exported onto the grid at a rate equivalent to the avoided energy costs of the distributor. Such a credit rate will not impact the price of all other customers. For municipalities this will be based on the energy only charges charged by Eskom to the municipality. For Eskom, this will be Eskom's average energy.

Export credit tariff = Avoided variable purchase cost of the distributor (either on a TOU basis or the weighted annual average if a single energy rate is used)

Stakeholder comment #19: Stakeholders are requested to comment on the appropriateness and the relevance of the aforementioned tariff method and the challenges.

11.5 Connection charges

Connection charges will apply to all customers who want to connect to the grid. The distributor will determine the connection charges in accordance with the principles contained in the Distribution Code.

Costs relating to grid connections, such as network studies, capital and metering is payable through the connection charge.

Stakeholder comment #20: *Stakeholders are requested to comment on the proposed approach to recovering the transmission connection cost and the raising of an early termination guarantee.*