



ENERGY DIRECTORATE

GEN/EMB

APPLICATION FOR THE CONNECTION OF SMALL-SCALE EMBEDDED GENERATION

Page 1

This application form is for the connection of any type of grid-tied small-scale embedded generation to the electrical installation of residential, commercial or industrial customers.

- A separate "Application for a new or modified electricity supply service" form must also be completed where the City will replace the existing credit meter with a prepayment meter.
- If the embedded generator is to be configured as a grid-tied hybrid SSEG 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 load from the inverter, operating in the stored-energy mode, shall be via a suitably interlocked change-over switch that is connected to the existing internal wiring of the property. In such a case, the certificate of compliance and test report for electrical installations from a qualified electrician must indicate accordingly.

Submit completed form to:

Customer Support Services: Area North		
Test & Metering Building Ndabeni Electricity Complex Melck Street NDABENI	Ndabeni Electricity Complex Melck Street NDABENI 7405	Tel: 021 444 2096/7 Fax: 021 444 2112 Email: sseg.north@capetown.gov.za
or Customer Support Services: Area East		
Electricity Generation & Distribution Head Office Bloemhof Centre Bloemhof Street BELLVILLE	Private Bag X44 BELLVILLE 7535	Tel: 021 444 8511/2 Fax: 021 444 8787 Email: sseg.east@capetown.gov.za
or Customer Support Services: Area South		
1 st Floor Wynberg Electricity Depot Rosmead Avenue WYNBERG	Wynberg Electricity Depot Rosmead Avenue WYNBERG 7800	Tel: 021 763 5664/5723 Fax: 021 763 5687 Email: sseg.south@capetown.gov.za

Property name and location:

Project name:
Erf number:
Physical address:
Township / Suburb / Farm:
Postal code:

Name and account numbers of property owner:

First name:		Last name:		Title:	
Business partner number as per municipal account:		Contract account number:			

Property owner contact details:

	Office	Mobile
Telephone number		
Facsimile number		
E-mail address		

Application type
(Tick appropriate boxes.)

	<input checked="" type="checkbox"/>
Residential	
Commercial/Industrial	
New	
Revised application	
System modification or expansion	
Change of property owner	
Other (specify)	

Planned construction schedule:

Projected construction start date	
Projected in-service date of embedded generator	

Mode of embedded generation:
(Tick appropriate box.)

	<input checked="" type="checkbox"/>
Energy from embedded generation to be used within a customer's electrical installation and no excess to be exported to City of Cape Town Electricity's distribution network	
Energy from embedded generation to be used within a customer's electrical installation and excess to be exported to City of Cape Town Electricity's distribution network	

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

Battery storage
(Tick appropriate box.)

	<input checked="" type="checkbox"/>
Yes	
No	
kWh	

Type of energy conversion:

(E.g. synchronous generator, induction generator, inverter, fuel-cell, dyno set. (Include operating characteristics)

--

Site plan:

Latitude (dd mm sss)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">S</td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">°</td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">'</td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">"</td> <td style="width: 10%;"></td> </tr> </table>	S		°		'		"	
S		°		'		"			
Longitude (dd mm sss)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">E</td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">°</td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">'</td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">"</td> <td style="width: 10%;"></td> </tr> </table>	E		°		'		"	
E		°		'		"			
For commercial/industrial only (show location and dimensions of intended installation infrastructure in relation to the existing buildings and property point of connection)									

Site land use zoning:

--

Preliminary design¹:

(To be attached.)

Circuit diagram and design showing major components, proposed point of common coupling, isolating and interfacing devices with City of Cape Town electrical network, protection schemes, customer electrical installation, operating characteristics, etc.	
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Earthing arrangements i.e. TN-C-S	
-----------------------------------	--

Total capacity of embedded generation (kVA and PF²):

(Attach schedule for each unit if more than one generation unit or location.)

--

Property distribution board main circuit breaker

Ampere (A)	Single- or three-phase

¹ For guidance here, it is recommended that an installer/supplier be consulted.

² This will mainly apply to systems that make use of rotating machines e.g. wind power, hydro or diesel generators. For static power converters (e.g. inverters with a solar PV system), the power factor is generally 1 and the kWp of the system will be the same as the kVA.

APPLICATION FOR THE CONNECTION OF SMALL-SCALE EMBEDDED GENERATION

Proposed consumption and generation levels:

(Complete the table below.)

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

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

Make & model of key generating equipment:

Manufacturer:				
Model:				
Number:				
Phase:	Single	<input type="checkbox"/>	Three	<input checked="" type="checkbox"/>

(Tick appropriate box.)

Electrical parameters of embedded generation³:

(All units in parallel, to be used for fault-level studies. Not all of these parameters apply to all modes of SSEG. Insert N/A if not applicable)

Rated voltage	Maximum MVar limit	Inertia constant

Maximum peak short-circuit current (A)	Single- or three-phase

Neutral to earth resistance (Ω)	X _d – Synchronous reactance (p.u.)	X' _d – Direct axis transient reactance (p.u.)

³ Professional or reputable installer/supplier should provide. For static power converter-based systems (e.g. solar PV inverters) many of these electrical parameters do not apply.

X"d – Direct axis sub-transient reactance (p.u.)	X2 – Negative sequence reactance (p.u.)	X0 – Zero sequence reactance (p.u.)

Electrical parameters of generator and unit transformers⁴:
 (Not all of these parameters apply to all modes of SSEG. Insert N/A if not applicable.)

Voltage and power ratings	Winding configuration

Neutral earth resistor or reactors (NER / NECR impedance)

Positive and zero sequence impedances (p.u.)	
R1	X1
R0	X0

Network connection point:
 (In the case of the applicant not currently being a consumer of energy only, attach a single line diagram showing arrangement.)

--

Protection details⁵:

Method of synchronising: (Auto/Manual, make and type of relay, etc.)	
-------------------------------------------------------------------------	--

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

⁴ Professional or reputable installer/supplier should provide. For static power converter-based systems (e.g. solar PV inverters) many of these electrical parameters do not apply.

⁵ Professional or reputable installer/supplier should provide.

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

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

Recording of quality of supply devices	
----------------------------------------	--

List of regulatory approvals, requirements and normative references⁶:

(Tick appropriate box or mark not applicable N/A.)

	✓
Electricity Regulation Act, Act 4 of 2006 and Electricity Regulation Amendment Act, Act 28 of 2007	
Occupational Health & Safety Act, No. 85 of 1993 as amended	
South African Distribution Code (all parts)	
South African Grid Code (all parts)	
South African Renewable Power Plants Grid Code	
City of Cape Town Electricity Supply By-Law	
SANS 474 / NRS 057 : Code of Practice for Electricity Metering	
SANS 10142- Parts 1 to 4: The wiring of premises (as amended and published)	
SANS/IEC 61646: Thin film terrestrial PV modules – design qualification and type approval	
SANS/IEC 62109-1, Safety of power converters for use in photovoltaic power systems Part 1: General Requirements	
SANS/IEC 61215: 2005 Crystalline silicon terrestrial PV modules – Design qualification and type approval	
SANS/IEC 60364-7-712 Requirements for special installations or locations – Solar photovoltaic (PV) power supply systems: 2016	
NRS 048: Electricity Supply – Quality of Supply	
NRS 097-1 : Code of Practice for the interconnection of embedded generation to electricity distribution networks : Part 1 MV and HV	
NRS 097-2: Grid interconnection of embedded generation: Part 2: Small scale embedded generation	

⁶ Note: It is the responsibility of the ECSA registered professional engineer/engineering technologist/certificated engineer/engineering technician to ensure compliance through their professional sign-off of the installed system in Appendix 1 – SSEG Installation Commissioning Report.

Clearance by other City of Cape Town departments

FUNCTION	SECTION	COMMENTS	NAME	SIGNATURE	DATE
Zoning/subdivision/ building structure plans	Planning and Building Development Management (Area offices)				
Noise impact assessment and ventilation	City Health Specialised Services 22 nd floor Cape Town Civic Centre (021) 4003781				
Air pollution and quality (Fuel burning)	City Health Specialised Services 246 Voortrekker Road VASCO (021) 5905200				

Note:

1. Energy Directorate will require **prior** approval from these departments. Applications to connect to the grid will not be considered until all relevant approvals have been obtained.
2. Photovoltaic (PV) SSEG applications will require approval from Planning and Building Development Management only if:
 - a) Roof top installations: PV panel(s) in its installed position projects more than 1,5m, measured perpendicularly, above the roof and/or projects more than 600mm above the highest point of the roof;
 - b) Installations on the ground: PV panel(s) in its installed position projects more than 2,1 metres above the natural/finished ground level.

Installer Details

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

Any other additional information:

I request the City of Cape Town Energy Directorate to proceed with the review of this embedded generation interconnection application. I understand that:

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

I further give my consent to the City of Cape Town providing this information to the National Energy Regulator of South Africa (NERSA) and other Distributors, as required.

APPLICATION FOR THE CONNECTION OF SMALL-SCALE EMBEDDED GENERATION Page 8

Application completed by:

Name:	Title:

ECSA-registered professional

Name:	Reg. no:	Registration category:
-------	----------	------------------------

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

Signed (Applicant): _____

Date:

Signed (property owner): _____

Date:

FOR OFFICE USE

Date application received:

Application notification No.

Further Information Required: (E.g. Competent Person detail required in terms of Occupational Health and Safety Act, General Machinery Regulations: Supervision of Machinery, Section 2)

YES		NO	
-----	--	----	--

Date received:

More detailed studies Required: (fault level, voltage rise, unbalance, flicker, harmonics, protection, etc.)

YES		NO	
-----	--	----	--

Date complete:

Approved in Principle:

YES		NO	
-----	--	----	--

Date applicant advised:

Copy to Network Control:

YES		NO	
-----	--	----	--

Date completed:

Copy to distribution district construction supervisor:

YES		NO	
-----	--	----	--

Date completed:

Copy to MV/HV Section for SSEG > 1kV:

YES		NO	
-----	--	----	--

Date completed:

Appendix 1 – SSEG Installation Commissioning Report

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

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

Installer details		
Installer		
Accreditation/qualification		
Address (incl. post code)		
Contact person		
Telephone number		
Fax number		
E-mail address		
Information to be enclosed		
Final copy of circuit diagram		
An electrical installation Certificate of Compliance		
Signed contract for SSEG		
Compulsory declaration – to be completed by ECSA-registered Pr Eng, Pr Tech Eng, Pr Cert Eng for any SSEG installation or Pr Techni Eng for residential SSEG installations only.		
The SSEG installation complies with the relevant sections of NRS 097-2-1: 2017 and South African Grid Codes.		
The loss of mains protection has been proved by a functional test carried out as part of the on-site commissioning, e.g. a momentary disconnection of the supply to the SSEG in order to prove that the loss of mains protection operates as expected.		
Protection settings have been set to comply with NRS 097-2-1: 2017 and the approved generation capacity maximum output of the inverter has been limited by appropriate hardware or software settings.		
Safety labels have been fitted in accordance with NRS 097-2-1: 2017.		
The grid-tied SSEG installation complies with the relevant sections of SANS 10142-1 and an installation certificate of compliance and test report for electrical installations, are attached.		
And, where applicable for a grid-tied hybrid SSEG installation, the suitably interlocked change-over switch conforms to the requirements of Appendix 4 of the Requirements for SSEG document.		
Reverse power flow blocking protection has been installed and commissioned to prevent reverse power flow into the distribution electricity network (where applicable).		
Comments (continue on separate sheet if necessary).		
Name:	Signature:	Date:
ECSA-professional category:	Reg. No.	

Appendix 2 – SSEG Decommissioning Report

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

Decommissioning agent details		
Name		
Accreditation/qualification		
Address (incl. post code)		
Certificate of Compliance number (provide copy of the CoC which confirms that the SSEG has been disconnected effectively from the City's electricity distribution network)		
Contact person		
Telephone number		
Fax number		
E-mail address		
Name:	Signature:	Date: