

ELECTRICITY SERVICES

APPLICATION FOR THE CONNECTION OF EMBEDDED GENERATION

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This application form for the connection of embedded generation is for small-scale embedded generators to be installed by residential, commercial or industrial customers. It is applicable to all forms of embedded electricity generation, including renewable energy and cogeneration. A separate "General Application Form for New or Modified Connections" must also be completed other than for instances where reverse power blocking is to be installed.

Submit completed form to:

THEEWATERSKLOOF ELECTRICAL DEPT	
Technical Building 26 Church street Caledon 7320	Tel: 0282143300 ext 4244 Fax: 0862183338 Email: johannesva@twk.org.za

Property name and location:

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

Name and account numbers of property owner:

(Only if embedded generation is to be connected with Theewaterskloof Municipality's Electricity consumer's network)

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

Property owner contact details:

Telephone number

Office	Mobile

Facsimile Number

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E-mail address

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Application type
(Tick appropriate boxes)

	<input checked="" type="checkbox"/>
Residential	
Commercial/Industrial	
New	
Revised application	
Upgrade existing system	
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)

Energy from embedded generation to be used within a consumer's electricity network and no excess to be exported to Theewaterskloof Electricity's distribution network	<input checked="" type="checkbox"/>
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Type of prime mover and fuel source for embedded generation: e.g. photo-voltaic, concentrated solar power, small hydro, landfill gas, biomass, biogas, wind, cogeneration

Battery storage
(Tick appropriate box)

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

Type of energy conversion:
E.g. Synchronous generator, induction generator, inverter, fuelcell, dyno set. (Include operating characteristics).

Site plan:

Latitude (dd mm sss)	S ° ' "
Longitude (dd mm sss)	E ° ' "
For commercial/industrial only (show location and dimensions of intended installation infrastructure in relation to the existing property point of connection and buildings.)	

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, consumer network, operating characteristics, etc.	
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Earthing arrangements i.e. TN-C-S	
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¹ For guidance here it is recommended that an installer/supplier be consulted

Total capacity of embedded generation (kVA and PF)²:

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

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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 :

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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 multiphase

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.

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

Neutral to earth resistance in ohms	Xd – Synchronous reactance in p.u.	X'd – Direct axis transient reactance in p.u.

X''d – Direct axis subtransient reactance in p.u.	X2 – Negative sequence reactance in p.u.	X0 – Zero sequence reactance in 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 in p.u.	
R1	X1
R0	X0

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Network connection point:

(In the case of applicant not being an existing consumer only, attach a single line diagram showing arrangement)

Protection details⁵:

Method of synchronising: (Auto/Manual, make and type of relay, etc.)	
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Method of antiislanding: (Details of scheme, relays to be used, etc.)	
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Method of generator control: (AVR, speed, power, PF, excitation system requirements etc. relays to be used)	
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Other main protection to be applied: (O/C, E/F, over/under voltage, over/under frequency, reverse power, back-up impedance, generator transformer back-up earth fault, HV breaker fail, HV breaker pole disagreement, etc.)	
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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.

Recording of quality of supply devices	
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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)	
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	

Clearance by other Theewaterskloof Municipality departments

FUNCTION	SECTION	COMMENTS	NAME	SIGNATURE	DATE
Zoning/subdivision/ building structure plans	Planning and Building Development Management				
Noise impact assessment and ventilation	Planning and Building Development Management				
Air pollution and quality (Fuel burning)	Planning and Building Development Management				

Note:

1. Electricity Services 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 only Planning and Building Development Management.

Installer Details

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

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

Any other additional information:

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I request Theewaterskloof Municipality Electricity Department 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 consent to Theewaterskloof Municipality providing this information to the National Transmission Company and other Distributors as required.

Application completed by:

Name:		Title:
Name:	Reg. no:	Registration category:

ECSA registered professional

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

Signed (Applicant):

Date:

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Signed (property owner):

Date:

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FOR OFFICE USE

Date application received:

Application notification No.

Further Information Required

Competent Person detail required in terms of Occupational Health and Safety Act, General Machinery Regulations: Supervision of Machinery, Section 2):

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
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Date received

More detailed studies Required

(fault level, voltage rise, unbalance, flicker, harmonics, protection, etc.):

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
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Date completed

Approved in Principle:

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
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Date applicant advised:

Copy to System Control:

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
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Date completed:

Copy to distribution district Installation inspector:

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
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Date completed:

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

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
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Date completed:

Appendix 1 – SSEG Installation Commissioning Report

The following SSEG Commissioning Report must be submitted for each installation, confirming compliance with the Theewaterskloof Municipality'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	
Inverter type test Certificate of Compliance and Test Report according to NRS 097-2-1, issued by accredited 3 rd party test house (Not necessary if already provided).	
Factory setting sheet or other documentation showing that the inverter has been set according to NRS 097-2-1	
An electrical installation Certificate of Compliance.	
Signed contract for SSEG	
Operation and maintenance procedure	
Compulsory declaration – to be completed by ECSA registered Pr Eng or Pr Tech Eng	
The SSEG installation complies with the relevant sections of NRS 097-2-1.	
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	
Safety labels have been fitted in accordance with NRS 097-2-1	
The SSEG installation complies with the relevant sections of SANS 10142-1 and an installation certificate of compliance is attached.	
Reverse power blocking protection system installed and commissioned to prevent reverse power flow onto the distribution electricity network.	
Comments (continue on separate sheet if necessary)	
Name:	Signature:
ECSA professional category:	Reg. No.
Date:	

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 certified 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	