Date received stamp

CENTLEC

Reg No 2003/011612/30

Ref Nr _____

APPLICATION FORM FOR EMBEDDED GENERATION

Return Completed Forms To:	Centlec (SOC) Ltd Customer Care 30 Rhodes Avenue Oranjesig Bloemfontein 9301	Telephone: 051 409 2251/2
	or	
	E-mail addresses:	
	Kedibone.Mogorosi@centlec.co.za	
	Hlekiwe.Jonas@centlec.co.za	

Applicant Contact Details	Name	
	Telephone Number	
	Cell Number	
	Facsimile Number	
	E-Mail Address	
	Address	

Electricity Account Holder	
Electricity Account Number E.g.: residential, industrial	
Electricity Meter Number and type of use (Only if embedded generation is to be connected within a CENTLEC consumer's network)	

Address of Embedded Generator Installation- Site nr / farm name, Street and Area or Town name (Include GPS coordinates)	

Mode of Embedded Generation: (Tick appropriate box)	Energy from Embedded Generation to be used solely within a consumer's electricity network	
	Energy from Embedded Generation to be used within a consumer's electricity network and excess to be exported to CENTLEC distribution network	
	Energy from Embedded Generation to be used solely for exporting to CENTLEC distribution network	
	Energy from Embedded Generation to be used solely for wheeling to third party through CENTLEC distribution network	

Energy/Fuel Source for Embedded Generation: E.g.: Coal, Gas, Bagasse, Hydro, Wind, Photo-Voltaic, etc.		
Expected Life of Embedded Generation Project		years

Type of Energy Conversion/Storage capabilities Eg: Synchronous Generator, Asynchronous/Induction Generator, Inverter, Fuel Cells, etc	

Complete the applicable table below				
TABLE 1: NEW EMBEDDED GENERATION INSTALLATION				
Total Capacity of Embedded Generation (kVA) and PF) Attach schedule for each unit if more than one generation unit		kVA		PowerFactor
Total Export Generation Capacity (kVA) and PF) (Maximum power intended for export into CENTLEC distribution network)		kVA		PowerFactor
Required NERSA registration, e.g. 100 kVA and above (Mark with X)	**YES**		**NO**	
TABLE 2: ADDITIONAL INSTALLATION TO THE EXISTING EMBEDDED GENERATION				
Total Capacity of the Existing Embedded Generation (kVA) and PF) Attach schedule for each unit if more than one generation unit		kVA		PowerFactor
Total Capacity of the New Embedded Generation (kVA) and PF) Attach schedule for each unit if more than one generation unit		kVA		PowerFactor
Total Capacity of the Embedded Generation for the site/stand.		kVA		PowerFactor
Total Export Generation Capacity (kVA) and PF) (Maximum power intended for export into CENTLEC distribution network)		kVA		PowerFactor

Proposed Project Start Date	
Proposed Project Completion Date	

Electrical Parameters of Embedded Generation:	Positive Sequence Impedance	Negative Sequence Impedance	Zero Sequence Impedance
(All units in parallel, to be used for fault-level studies) Attach all generator and transformer data sheets for modeling analysis.			
Three phase symmetrical fault level contribution from the embedded generators		MVA	

Generator Transformer Parameters (if generator transformer is used to step up the voltage level prior to export)		
	E.g.	
Rating in kVA		
Voltage Ratio(s) (kV/kV)	**400V/11kV**	
Transformer Impedance	**4,5 %**	
Tap Change range +/- in percentage	**-5 % and 5 %**	
Tap Change step size in percentage	**2,5 %**	
Tap Changer type, eon-load, off load	**Off load**	
Tap Changer location (HV or LV side)	**HV**	
Winding Vector Group	**Dyn11**	
Method of HV Winding earthing	**None**	
Method of LV winding earthing	**None**	
NER/NEC/NECR size	**None**	

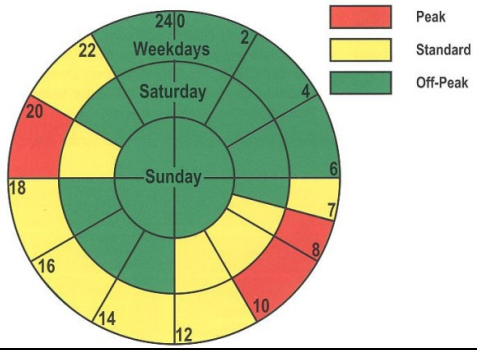
Point of Common Coupling: (Isolation point to be used to connect/disconnect embedded generation from the Distribution Network, attach single-line diagram showing arrangement including consumer network)	

Network Connection Point: (In the case of applicant not being an existing consumer only, attach single-line diagram showing arrangement)	

Protection Details: (Attach data sheets)	
Method of synchronizing: (Auto/Manual, make and type of relay etc.)	
Method of anti-islanding: (Details of scheme, relays to be used etc.)	
Method of generator control: (AVR, speed, power, PF etc. relays to be used)	
Other protection to be Applied: (O/C, E/F, over/under voltage, over/under frequency, reverse power etc.)	

Intended Recipient of Embedded Generation Output: (Own use, CENTLEC Consumer)	

Has a Power Purchase Agreement been entered into with a Recipient: (If yes, supply details)	**Under negotiation**

Proposed Generation Power Output Levels:		**TOTAL GENERATION**		**EXPORT**	
	**Peak Period**		**kWh**		**kWh**
	Standard Period		**kWh**		**kWh**
	Off-Peak Period		**kWh**		**kWh**
	TOTAL		**kWh**		**kWh**

Proposed Total Monthly Energy Generation: (Attach schedule if monthly generation is not consistent, e.g. linked to availability of prime energy source)	

Any projects in existence like the proposed embedded generation project:	

Has Incentive Capital Funding been obtained for this Installation: (Mark with X)	**YES**		**NO**	
Has a subsidy been granted for production of energy from this installation: (Mark with X)	**YES**		**NO**	

List of Regulatory Approvals:
National Electricity Regulator in Terms of Electrical Act for>5GWh/annum or>500 kW
Department of Environmental Affairs & Tourism in terms of Environment Conservation Act etc.

I agree to the terms in Annexures A, B & C (Mark with X)	**YES**		**NO**	

Application Completed by:	
Designation:	
Date:	
Signature:	

ADDITIONAL COMMENTS

FOR OFFICE USE							
Date Application Received:						**Application Reference No:**	
Further Information Required:	**YES**		**NO**			**Date Received:**	
Load Flow Analysis Required:	**YES**		**NO**			**Date Complete:**	
Fault Level / Protection Grading Study Required:	**YES**		**NO**			**Date Complete:**	
Approved in Principle:	**YES**		**NO**			**Date Applicant Advised:**	

ANNEXURE A: Check List

		Yes	No
Requirements for Small Scale Embedded Generation (SSEG) Application			
1	Proxy Letter: Required if the applicant is not the owner.		
2	Owner's ID Copy: A certified copy of the owner's identification.		
3	Module Data Sheet: Technical specifications for solar modules.		
4	Inverter Data Sheet: Technical specifications for the inverter.		
5	Inverter Certificate: Certification for the inverter.		
6	Philosophy Control Document: Document outlining the control philosophy.		
7	Single Line Diagram (SLD): A simplified diagram of the electrical system.		
8	In case of Commercial customer for applications greater than 350kVA Grid Impact Study is needed.		

ANNEXURE B

	Documentation Required for Small Scale Embedded Generation (SSEG) after Commissioning
1	Commissioning report – Draft (To be signed by PR. Engineer after the relevant commissioning tests are completed on the day of CENTLEC' site visit)
2	Installation Safety Report
3	General Single Line Diagram
4	Panel and string lay-out
5	Framing and Earthing Layout
6	Main Equipment Layout
7	PV Single Line Diagram
8	Low Voltage Certificate of Compliance to SANS 10142-1 - (Pr. Engineer or responsible person signed off copy to be forwarded)

ANNEXURE C

	Responsibilities of Embedded Generators to CENTLEC (Distributor)
1	The Embedded Generator shall enter into a connection agreement with CENTLEC (Distributor) before connecting onto the Distribution System.
2	The Embedded Generators shall ensure that reliability and Quality of Supply comply with the terms of the connection agreement.
3	The Embedded Generator shall comply with the Distributor's protection requirement as well as protection of own plant against abnormalities, which could arise on the Distribution System.
4	The Embedded Generator shall be responsible for any dedicated connection costs incurred on the Transmission System or Distribution System because of connection of the Embedded Generation facility to the Distribution System.
5	The Embedded Generator shall be responsible for synchronizing the generating facility to the Distribution System within pre-agreed settings.

Connection Point Technical Requirements	
1	The Embedded Generator shall be responsible for the design, construction, maintenance, and operation of the equipment on the generation side of the connection point.
2	The Embedded Generator shall be responsible for the provision of the site required for the installation of the Distributor's equipment required for connecting the generating facility.
3	The technical specifications of the connection shall be agreed upon by the participants based on the Distribution System Impact Assessment Studies.
4	A circuit breaker and visible isolation shall be installed at the connection point to provide the means of electrically isolating the Distribution System from the generating facility.
5	The Embedded Generator shall be responsible for the circuit breaker to connect and disconnect the generator plant.
6	The location of the circuit breaker and visible isolation shall be decided upon by the participants.
Protection Requirement for Embedded Generators **General Protection Requirements**	
1	The Embedded Generator's protection shall comply with the requirements of CENTLEC.
2	Additional features including inter-tripping and generator plant status to be agreed upon by the participants.
3	The protection schemes used by the Embedded Generator shall incorporate adequate facilities for testing and maintenance.
4	The protection scheme shall be submitted by the Embedded Generator for approval by CENTLEC.
Specific Protection Requirements	
1	**Phase and Earth Fault Protection** (a) The protection system of the Embedded Generator shall fully coordinate with the protective relays of the Distribution System. (b) The Embedded Generator shall be responsible for the installation and maintenance of all protection relays at the connection point.
2	**Over/under Voltage and over/under Frequency Protection** (a) The Embedded Generator shall install over/under voltage and over/under frequency protection to disconnect the generating facility under abnormal network conditions as agreed between the Distributor and the Embedded Generator.
3	**Faults on the Distribution System** (a) The Embedded Generator shall be responsible for protecting its generation facility in the event of faults and other disturbances arising on the Distribution System.
4	**Islanding** (a) The Embedded Generation facility shall be equipped with loss of mains detection protection system to prevent the generator from being connected to a de-energised Distribution System. The Distributor shall take reasonable steps to prevent closing circuit breakers onto an islanded network. (b) For unintentional network islanding, the Embedded Generator and the Distributor shall agree on methodology for disconnecting and connecting the Embedded Generator.
Quality of Supply Requirements	
1	**Frequency Variations** The Embedded Generation facility shall remain synchronized to the Distribution System while the network frequency always remains within the agreed frequency limitations.
2	**Power Factor** (a) The power factor at the connection point shall be maintained within the limits agreed upon by CENTLEC.
3	**Fault Levels** (a) The Embedded Generator shall ensure that the contractually agreed fault level contribution from the generation facility shall not be exceeded at any time.

Telemetry	
1	The Embedded Generator shall have the means to remotely report any status change of any critical function that may negatively impact on the Quality of Supply of the Distribution System.
Operational Responsibilities of Embedded Generators	
1	The Embedded Generator shall ensure that its generating units are operated within the capabilities defined in the Connection Agreement entered with the Distributor.
2	The Embedded Generator shall reasonably cooperate with the Distributor in executing all the operational activities during an emergency generation condition.
3	The Embedded Generator shall assist the Distributors in correcting Quality of Supply problems caused by its equipment connected to the Distribution System.
4	All customers must declare any co-generating plant (whether licensed or not) and specify the interlocking mechanism to prevent inadvertent parallel operation with the Distributor's network.
5	Embedded Generators shall have the required protection to trip in the event of a momentary supply loss causing an island condition to prevent paralleling out of synchronism due to auto-reclose functionality on the Distributor's Network.
Fault Reporting and Analysis/Incident Investigation	
1	The Embedded Generators shall report the loss of generation (as agreed by the participants) to the Distributor within 15 minutes of the event occurring. Notice of the intention to reconnect such shall be given with at least 15 minutes' advance notice to enable the Distributor to take any necessary action required.
Outage Scheduling and co-ordination	
1	Embedded Generators with a maximum capacity greater than 1MW shall furnish the Distributor with information on planned outages in order for the Distributor to properly plan, and coordinate its control, maintenance and operation activities.
Standards to abide by	
1	NRS 097: GRID INTERCONNECTION FOR EMBEDDED GENERATION
2	NRS 048: ELECTRICITY SUPPLY: QUALITY OF SUPPLY
Additional Requirements	
1	Where the 11 kV side of the generator transformer is Star, an NER must be fitted.
2	Where the 11 kV side of the generator transformer is Delta, an NECR must be fitted.