SOLAR ROOFTOP PV GENERATION IN MUNICIPALITIES

FREQUENTLY ASKED QUESTIONS

For municipalities, installers, and customers

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by:
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

SAGEN
SOUTH AFRICAN-GERMAN ENERGY PROGRAMME

SOUTH AFRICAN LOCAL GOVERNMENT ASSOCIATION
SALGA
Inspiring service delivery

This Booklet was developed as part of the SAGEN Programme[1] to provide technical support to municipalities seeking to develop processes to accommodate embedded generation in a safe, technically complaint and financially sustainable manner.

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Acknowledgements: We thank all participants of the Programme for their insightful questions which helped compile these questions.

Design: Dotted Line Design

Cover photo: DebbieMous on Freeimages.com

1 ***The South African - German Energy Programme (SAGEN)*** is part of the bilateral cooperation between South Africa and Germany. SAGEN is funded by the German Federal Ministry of Economic Cooperation and Development and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in cooperation with the Department of Mineral Resources and Energy (DMRE), Eskom and the South African Local Government Association (SALGA). For additional information please visit www.sagen.org.za.

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Glossary & Definitions

Alternating Current	The voltage and current changes polarity at a fixed frequency; 50Hz in South Africa. Most residential and commercial users of electricity require alternating current (AC).
Anti-Islanding	The functionality of a Small-Scale Embedded Generator (SSEG) installation to instantly and automatically disconnect the generator from the municipal electrical grid whenever there is a power outage at the utility municipal electrical grid, thus preventing the export of electricity to the municipal electrical grid from the SSEG.
Bi-Directional Meter	A meter that separately measures electricity flow in both directions (import and export OR consume and produce).
Customer	The person who buys and uses electricity supplied by the utility (Eskom/Municipality). In the context of this document, customers who also generate below 1MW shall be referred to as “customers”, although in effect they are “producers/generators”.
Direct Current	The voltage and current are a steady value, e.g. from a battery. Direct current (DC) is typically converted to alternating current for practical purposes as most modern uses of electricity require alternating current. Batteries and Solar PV modules are examples of DC power sources.
Embedded Generator	An electrical generator that is interconnected with the municipal network. The generator thus operates in parallel with the network and should be in synchronisation with the grid supply.
Grid limiting	When a SSEG is installed in such a way that export of excess power is limited or prevented by throttling the inverter power output. When the export of excess power is prevented it is also known as ‘reverse power flow blocking’.
Inverter	A power device that converts direct current (DC) to alternating current (AC) at a voltage and frequency which is usable by applicable AC appliances.
Small-Scale Embedded Generator (SSEG)	A small-scale embedded generator for the purposes of these guidelines is an embedded generator with a generation capacity of less than 1000 kW (1MW).
Utility	The electricity distribution service provider responsible for the electricity supply and grid infrastructure to which the customer is connected. (Both the municipality and Eskom are responsible for portions of the electricity network within the municipality’s boundary.)
Wheeling	The deemed transportation of electricity, over a utility’s electrical network from an EG in one place to a third party/customer in another place.

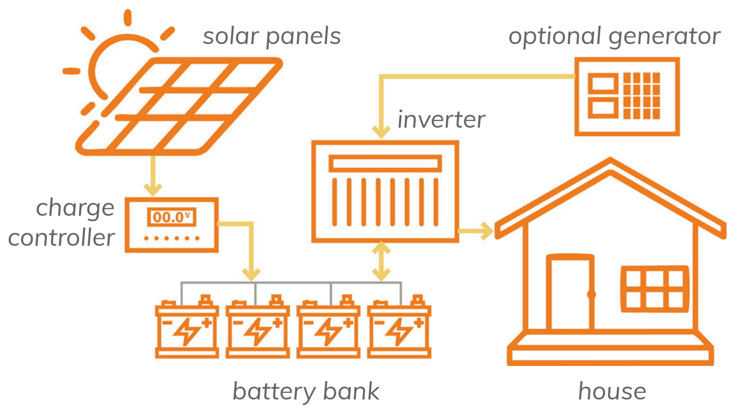
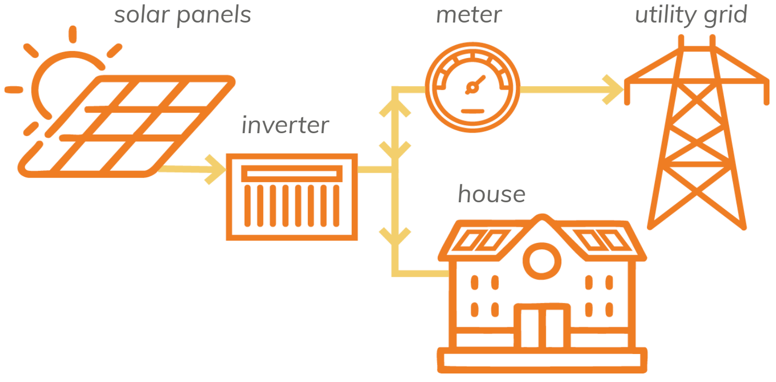
Introduction

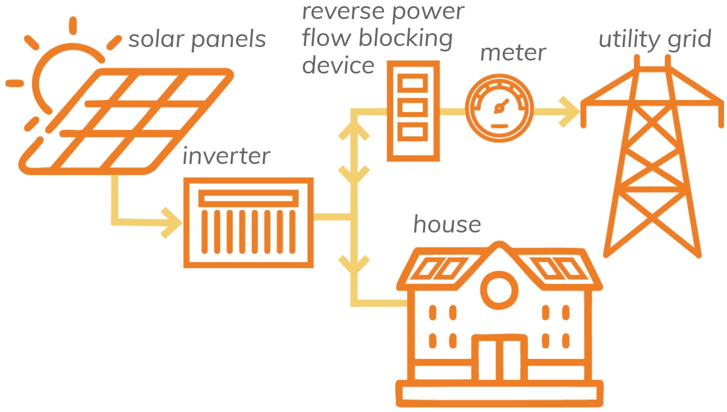
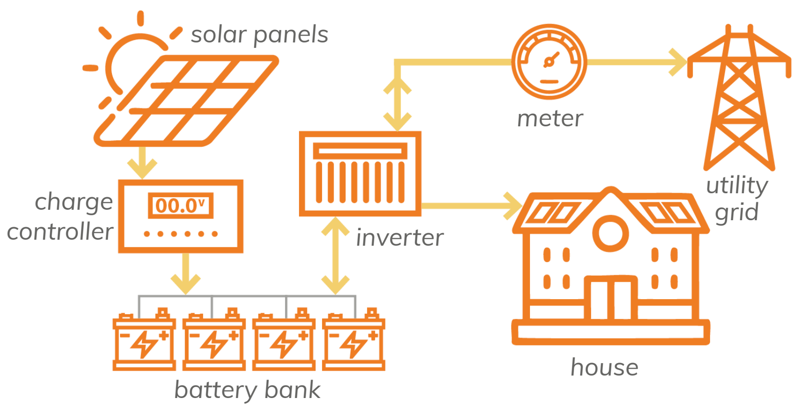
This FAQ booklet aims to clarify key issues related to rooftop solar photovoltaic (PV) systems and the associated registration processes for municipalities, installers, and customers. The questions were compiled from enquiries received through the Municipal Helpdesk (via email and phone) and during municipal training workshops.

Where applicable, references are provided to supporting documents and additional information, accessible via embedded links or through the Embedded Generation Resource Portal.

Frequently Asked Questions

Question		Answer
General questions: Solar Photovoltaic Embedded Generators		
1.	**What is Small-Scale Embedded Generation (SSEG)?**	SSEG refers to electricity generation systems with a capacity of less than 1 megavolt-ampere (MVA) that are connected to the local distribution network. Common examples include rooftop solar PV installations on residential, commercial, or industrial properties. These systems can operate in parallel with the grid, allowing for both on-site consumption and potential export of electricity.
2.	**What are the basic components of a solar PV system?**	A solar PV system is made up of different components. For an Embedded Generation installation (EG) system, these include: Solar PV modules Grid-tied inverter(s), Wiring Mounting hardware and/or a framework for the equipment Batteries (optional).

Question		Answer
General questions: Solar Photovoltaic Embedded Generators		
3.	**What types of solar PV SSEG systems exist?**	**I Off-grid** or **Stand-alone systems** operate continously, independent and separate from the local grid. There is no utility connection and batteries are used as a base supply. Solar energy is used to charge the batteries, the DC power from the batteries is converterted to AC using a battery inverter and the generator can be used to charge the batteries and/or supply the house in the event of insufficient solar power. In an urban setting, off-grid systems may be used for specific applications such as a pool pump that is not connected to the house's internal wiring.  *Figure 1: Off-grid Solar System with batteries (Renewable Stars, 2014)* **II Grid-tied feed-in systems** need the utility grid to connect and operate. The solar power is converted to AC by the grid-tied inverter, the house would use the solar power first and obtain power from the grid if there is not enough energy coming from the PV modules. If there is surplus solar energy, the excess energy that is not being used by the house will normally be exported back onto the grid.  *Figure 2: Grid-tied feed-in Solar System (Renewable Stars, 2014)*

Question		Answer
		General questions: Solar Photovoltaic Embedded Generators
3.	What types of solar PV SSEG systems exist?	**III Grid-tied non-feed-in systems** needs the utility grid to connect and operate. The solar power is converted to AC by the grid-tied inverter, the house would use the solar power first and obtain power from the grid if there is not enough energy coming from the PV modules. If there is surplus solar energy, the excess energy that is not being used by the house will be stopped from exporting back onto the grid by the reverse power flow blocking device.  Figure 3: Grid-tied with reverse power flow blocking (Renewable Stars, 2014) **IV Island/Hybrid systems** are connected to the grid, but can function like an off-grid system when needed. An Island system could provide AC power from DC power source as **an isolated system**. That means that even though there is AC power available from the local grid, the system could temporarily diconnect from the grid and function **independently**.  Figure 4: Island/Hybrid Solar System with batteries (Renewable Stars, 2014) Refer to https://www.sseg.org.za/faq/ for additional information.

Question		Answer
		Questions for customers and installers
4.	**Is registration of SSEG systems with the electricity distributor mandatory? Why?**	Yes, in South Africa, all grid-connected SSEG systems must be registered with the relevant electricity supplier, whether it's Eskom or a municipality. This requirement applies regardless of whether the system exports electricity to the grid or not. Registration is crucial for several reasons: – **Safety:** Unregistered or improperly installed systems can pose risks to maintenance personnel and the public. – **Grid Stability:** Properly registered systems help maintain the stability and reliability of the electricity grid. – **Legal Compliance:** Registration ensures adherence to national regulations and standards. – **Monitoring and Planning:** It allows utilities to monitor distributed generation and plan accordingly.
5.	**Can I install an off-grid solar PV system without registration?**	If you are completely off-grid—that is, your inverter has no connection to the utility supply—then registration is typically not required. However, several municipalities still require you to notify them about your system. It is important to ensure that your system is truly off-grid and not connected to or operating in parallel with the grid.
6.	**Do I only need to register my solar PV or SSEG system if I intend to export to the grid?**	All solar PV or SSEG systems must be registered with the municipality, even if you intend not to export.
7.	**Can I register an existing installation with the municipality, or only new systems?**	Both existing and new SSEG installations must be registered, since they all have implications for the electricity grid.
8.	**Are there costs associated with registration?**	The registration process itself is typically free of charge, although municipalities are allowed to change for this. However, there may be costs associated with technical assessments, meter installation, technical commissioning signoff, or modifications required to meet the technical standards set by the utility.

Question		Answer
		Questions for customers and installers
9.	**Can I wheel my surplus energy to my neighbour and have them pay me for their usage?**	In most cases, this is not permitted. While wheeling—transferring electricity to another user—is allowed in South Africa, it must take place via the distribution network and applies mainly to larger systems and requires specific conditions to be met.
10.	**If I live in a sectional title property or complex and receive my electricity bill from the body corporate, do I still need to register my system with the municipality?**	No, in this case, you must register your SSEG system with the body corporate. The body corporate is then responsible for applying to the municipality to obtain approval for all SSEG systems installed within the complex or estate.
11.	**Where can I find the contact details for the personnel responsible for SSEG in my municipality?**	If your municipality is registered on the SSEG Application Platform, you may apply to install your system online. If your municipality is not yet using the Platform, you can visit your municipality's official website or go in person to the general help desk or the electrical department to request the appropriate contact information. A municipal Embedded Generation Application Contact List can also be accessed here: https://www.sseg.org.za/contact-us/
12.	**Where can I access the application form and other necessary documents to apply for SSEG approval at my municipality?**	**If your municipality is registered on the SSEG Application Platform**: You can complete the online registration form and submit your application for approval directly through the Platform. **If your municipality is not registered on the SSEG website**: You can either download your municipality's specific application form (if available on their website) or contact the municipality directly to request it. **If your municipality does not have an established process or application forms:** It is best to ask your municipality what you should do. They are required by law to accept applications, so you could download the generic application form, regulations, and standard contract from sseg.org.za. These can be submitted to them for consideration.
13.	**Why is my municipality currently not listed on the Online SSEG Application Platform?**	Your municipality may not yet appear on the Online SSEG Application Platform because of internal issues. However, the municipality can be added to the portal quickly and easily. To facilitate this, a representative from the municipality simply needs to register and complete the onboarding process with a member of the SSEG support team at Sustainable Energy Africa.

Question		Answer
Questions for customers and installers		
14.	**How can I keep track or receive updates on my SSEG application?**	To receive an update on your application, you can contact your municipality directly to inquire about the status of their review. If you applied online on the application platform, you will be emailed status updates automatically as the municipality makes progress with your application.
15.	**Does the online SSEG registration platform allow me to register a solar PV installation as a back-up system?**	The SSEG online registration platform can register back-up or standby systems. However, it depends on whether the municipality has activated that feature for customers to register back-up systems.
16.	**Is the personal data provided on the online registration platform securely protected? What security measures are in place to prevent data breaches and ensure that the municipality's systems cannot be hacked?**	The Platform will retain customers' personal data for as long as is necessary for the purposes set out in the Privacy Policy. Data will also be treated in accordance with POPI. For more information on the platform security, refer to **Privacy Policy and Data Security Protocol - SSEG Online Application Portal**
17.	**Will government or the municipality impose additional "Solar Tax" on us if we do register our solar PV or SSEG system?**	There is no "solar tax" imposed on customers who register SSEG systems. The municipality must however make sure EG customers are on a tariff that does not result in other consumers subsidising them, and this will typically include a fixed monthly charge in the tariff.
18.	**Why is approval of building plans required?**	Usually building plans are only required if the EG extends beyond a particular height or horizontally beyond the building. This is in accordance with the Building Regulations. Check the municipal Embedded Generation Requirements document for details. Note that it remains the owner's responsibility to ensure that the roof or mounting structure is safe and capable of supporting the additional load from the solar PV system.

Question		Answer
Questions for customers and installers		
19.	**Why can't my installer sign off on the installation? Requiring a Pr. Person to sign off only adds to the cost.**	Some municipalities allow installers to sign off on smaller solar SSEG installations, while others require an ECSA registered Professional Person (Pr. Person) to sign off on all installation sizes. The main reason for this requirement is that there are currently no standards covering all aspects of EG installation, and different municipalities want to ensure that liability is covered. They choose different ways of covering this liability.
20.	**Is there a deadline or cut-off date to register my SSEG system?**	SSEG systems are legally required to be registered and approved prior to connection. Systems that are already installed need to be registered as soon as possible, as not doing so might lead to fines or not being covered by insurance as the installation is deemed not compliant.
Questions for the Municipality: Municipal Processes and Regulations		
21.	**Is there a guideline or standard documented process for the application process that a municipality can follow?**	The SSEG application process involves an application form and other documents from the AMEU-SALGA resource pack, which provide the municipality with the necessary system information to assess the proposal and either grant approval or not (or request changes or additional studies before approval). The municipality assesses the proposed system for safety, power quality, general grid impact and other issues before giving the customer the go-ahead or not. Any customer intending to install a solar PV system which will be connected to the municipal distribution grid (including via their own house/building wiring) is required to go through the application process. Basic system design and other information is required in the process, and therefore residential customers particularly will generally need the support of a solar PV installer to fill out the necessary application forms. AMEU-SALGA Resource Pack
22.	**Are by-law amendments or SSEG Policies necessary for a municipality to accept SSEG systems onto their grid? What are they?**	Electricity by-law amendments are recommended for municipalities accommodating SSEG systems on their network as it makes the SSEG Policy legally binding. The Policy is necessary as it clarifies what SSEG systems the municipality will and will not allow, and the criteria and process for applying for permission to install an SSEG system. Not having such a by-law results in areas of legal ambiguity and is therefore likely to result in more legal challenges and incidences of non-compliance. However, a municipality should not wait for a by-law in place before implementing a registration process (customers usually aren't waiting to install systems).

Question		Answer
Questions for the Municipality: Municipal Processes and Regulations		
23.	**What information is required in the SSEG application form and why is it required?**	A municipality typically asks for information relating to: The customer's location and electricity account details Information on the proposed SSEG installer Technical information on the proposed SSEG system (to enable an assessment in terms of NRS097-2-3) Inverter NRS097-2-1 certification Compliance with conditions of other municipal departments (e.g. Building Control) The above information then enables a comprehensive assessment of the SSEG in terms of safety and technical compliance.
24.	**What size SSEG systems can be allowed on the network?**	From a municipal perspective, the sizes that can generally easily be accommodated on the network are given in the NRS097-2-3 simplified connection criteria standard. Larger sizes than specified in this standard may be permitted but should be subject to grid impact studies before they can be approved or declined. Prospective SSEG customers need to be aware of this when they size their systems. Staying within the NRS097-2-3 parameters where feasible will lead to quicker assessments by the municipality in general. NRS 097-2-3:2023 Simplified Connection Criteria for LV Connected generators
25.	**Should the customer always re-apply when extending or replacing solar PV component?**	Although it may vary between municipalities, any increase in the system size requires a new application. Changing the inverter typically only requires a new commissioning report.
26.	**Who can sign off commissioning reports?**	Some municipalities accept and support the SAPVIA endorsed PV GreenCard installers or P4 Accredited Installers when it comes to commissioning sign-off of smaller systems (e.g. <30kWp), and ECSA register professionals (Pr.Eng, Pr.Tech.Eng, etc) above a specified size. Some municipalities only permit commissioning signoff by an ECSA Registered professional irrespective of system size Legally, there is no requirement for a Pr.Eng or Pr.Tech.Eng sign-off, and it is therefore at the discretion of the municipality what they wish to specify in this regard. An electrical wiring CoC is however always mandatory.

Additional resources

Support material for SSEG are listed below:

– SSEG General Information for Public

– SAPVIA PV Installation Guidelines