

Small Scale Embedded Generation: Registration vs. application for connection



Main Insights

The South African SSEG market has grown from a few hundred systems in 2015 to over 100 000 systems with an installed capacity of more than 1GW in 2020¹. Over the last two years, these systems have become increasingly innovative, including energy storage and smart home management.

The national regulatory environment has not kept up with the growing local market innovation, which has led to stakeholder uncertainty, increased project risk² and ultimately produced suboptimal market growth in a time when new electricity generation is needed.



South African energy landscape

South Africa's electricity demand is currently dominated by coal-fired power generation stations which are primarily owned and operated by Eskom, the national power utility. Eskom supplies ~95% of South Africa's total electricity demand. The remaining 5% is met through municipalities, imports and independent power producers (IPP). Energy demand has distinctly flattened since 2010, resulting in reduced demand for coal-based electricity (87% in 2010 versus 79% in 2019).

A historic imbalance of supply and demand in South Africa's single buyer energy model over more than ten years resulted in intensive load shedding experienced country-wide from 2008 to 2015 and again during 2019 and the first half of 2020. According to the Council for Scientific and Industrial Research (CSIR), an estimated 1.3TWh was load shed during in 2019 and 2020 alone. Load shedding has been driven by a combination of factors, including:

- Delayed commissioning and underperformance of new-build coal generation capacity;
- Degradation of the existing Eskom generation energy availability factor (EAF) declining from ~94% in 2002 to 67% in 2019.

¹ This market is currently dominated by rooftop solar photovoltaic installations given the price, technology maturity and ease of installation.

² This also leads to increased financing costs as lenders price in the perceived market risk.

Small Scale Embedded Generation

The national small scale embedded generation (SSEG) market for installations and operation and maintenance of rooftop solar photovoltaic (PV) has grown in the last two years. Rising electricity tariffs, decreasing solar PV costs and energy security remain the main drivers of this market.

It is expected that the total annual available market could grow to a saturation point of ~500 MWp installed per year on an ongoing basis. This market could reach a total of 7.5 GW of installed capacity by 2035 – a total available market of R75 billion.

One of the barriers in the market is stakeholder uncertainty and increased project risk on the back of the indistinct regulatory landscape. This is particularly true when it comes to the licensing and registration of SSEG systems. This impacts both future projects and projects already completed. If installed systems are found to not be correctly licensed and registered, customers can be charged a service fee for the disconnection of unauthorised SSEG connections.

Why is license and registration needed?

1. To ensure the safe connection of systems.
2. To ensure compliance with safety regulations
 - Safety for staff and customers.
3. To ensure the integrity of grid infrastructure.
4. To allow for appropriate planning of future grid upgrades and maintenance

The supply of electricity to the property in question may be disconnected. It will only be reconnected once the relevant authority is satisfied that the SSEG system is either disconnected, decommissioned or authorised and that the service fee has been paid.

Registration vs application for connection

Under the current South African policy and legal framework, any operation of a generation³, transmission or distribution facility shall either be licensed or registered with the National Energy Regulator of South Africa NERSA. There are three stages in the process:

1. Registration
2. Licensing
3. Ministerial determination.

SSEG with a capacity between 100kW and 1 MW requires registration with Nersa but does not need to be part of a ministerial determination. SSEG with a capacity greater than 1 MW but less than 10 MW needs to be licensed but does not need to be part of a ministerial determination.

Generation plant with a capacity >10 MW needs to be licenced and be part of a ministerial determination and national procurement. All generation connected to the grid needs to be registered with the relevant transmission/distribution grid operator

Essentially, there are three separate concepts to clarify in this process:

1. Registration with NERSA;
2. Generation licensing with NERSA; and
3. Application for connection (Distributor registration).

Table 1 below provides the current NERSA licensing, registration and application parameters for different SSEG system sizes.

Table 1: Licensing and registration for different SSEG system sizes

		<100kW	100kW-1MW	1MW-10MW	>10MW
NERSA	Registration	NO ⁴	YES	YES	YES
	Licensing	NO	NO	YES	YES
Eskom/Municipality	Application for connection	YES	Yes	YES	YES ⁵

³ Greater than 100kW

⁴ For this to be true, there has to be an existing point of connection, the local distribution utility must keep a register of such installations and the local distribution utility must prescribe the conditions for connection.

⁵ If not accounted for in the Integrated Resource Plan (IRP) a deviation from the IRP may be required.

In law, the registration and licensing of SSEG vests with Nersa and not municipalities. Regulation is an administrative activity, and Nersa has developed the applicable procedures.

Nonetheless, there is still confusion around application for registration (by Nersa) and application for connection (by the electricity distributor). For SSEG systems between 100kW and 1MW, there are two stages to the registration procedure as detailed in **Figure 1**.

First, the connection application must be made to the local municipality or Eskom for connection of the generation facility to the electricity grid.

Once this process has been completed, an application must be made to NERSA for the registration of the generation facility. This requires a letter from the local electricity distributor (municipality or Eskom) confirming that connection permission has been granted. NERSA has, since 2019, registered 139 projects to date with a capacity of 62MW in total.

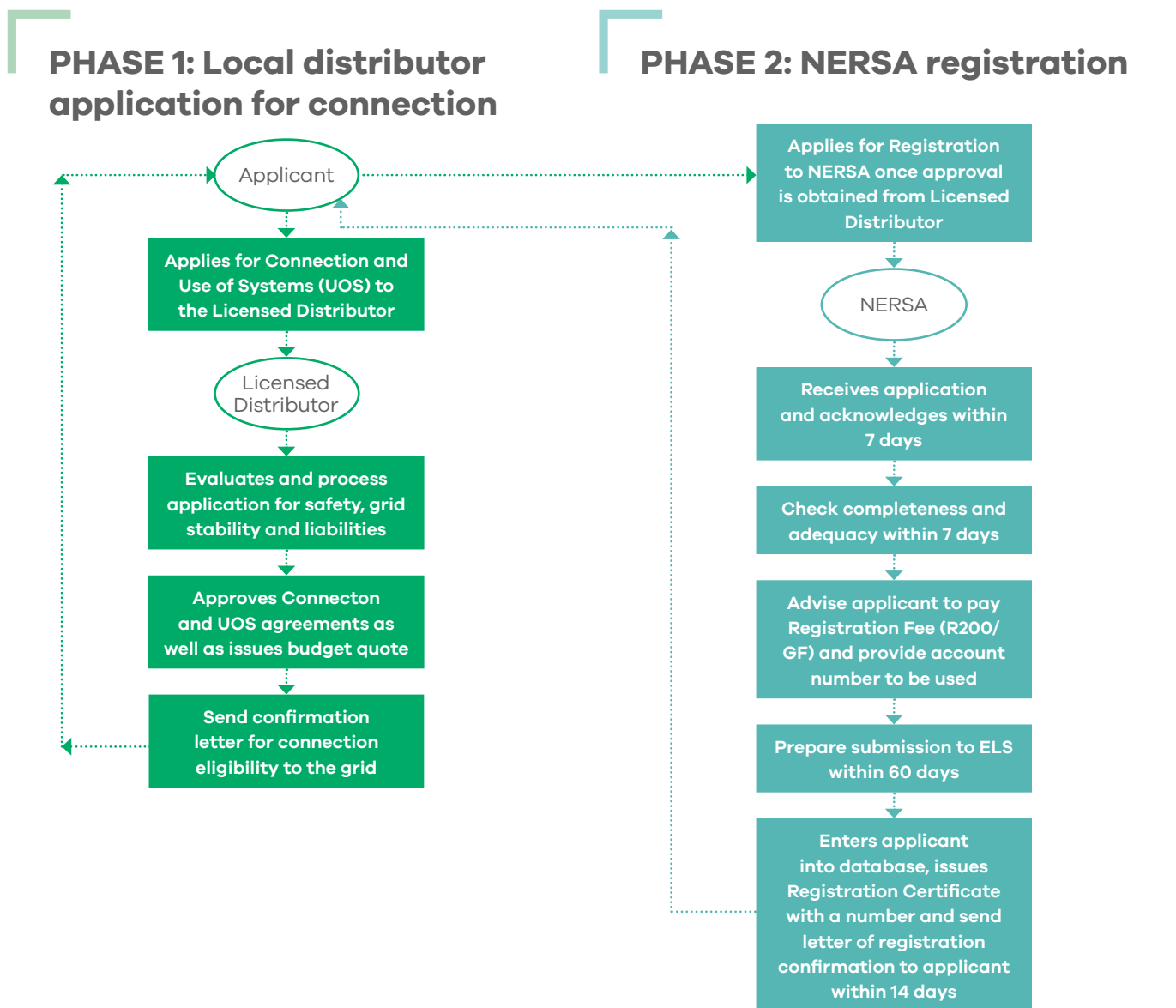


Figure 1: Registration and approval process for SSEG

As the SSEG market continues to grow, end-users and SSEG installers need to promote the application for connection with local electricity distributors and the registration with NERSA. It is the responsibility of local installers to ensure that their clients are informed of the correct procedure to avoid repercussions in the future.

Document links for registration and licensing

<p>NERSA Generation License application</p>	<p>Application procedure: http://nersa.org.za/license-application-procedure/</p> <p>Application form: http://nersa.org.za/license-application-form/</p>
<p>Registration</p>	<p>Registration procedure: http://nersa.org.za/registration-application-procedure/</p> <p>Registration forms: http://nersa.org.za/license-registration-application-forms/</p>
<p>Municipal registration (City Of Cape Town)</p>	<p>http://resource.capetown.gov.za/documentcentre/Documents/Forms%2c%20notices%2c%20tariffs%20and%20lists/Declaration%20for%20off-grid%20SSEG.pdf</p>
<p>Eskom grid-tied approval process</p>	<p>http://www.eskom.co.za/Whatweredoing/Pages/SmallMicroGeneration-.aspx</p>



Next steps

To find out more, contact GreenCape: energy@greencape.co.za
 For additional energy services information visit GreenCape's Energy Services webpage (www.greencape.co.za/content/energy-services)

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