**Small-Scale Embedded Generation (SSEG) in South Africa:**

**What It Means for Solar Users—and the Road Ahead**

**April 2025**

**Executive Summary**

Small-Scale Embedded Generation (SSEG) has taken centre stage in South Africa’s evolving energy sector. With regulatory clarity from Eskom mandating that all grid-connected solar systems—whether exporting power or not—must be registered, residential and commercial users alike are facing a new compliance reality.

This white paper provides a comprehensive overview of SSEG, analyses case studies across municipalities, explores registration costs and customer impact, and offers policy recommendations to align the system with South Africa’s Just Energy Transition objectives. It draws from real-world implementation data, user experience, and global benchmarks to support practical industry transformation.

**1. What is SSEG and Why It Matters**

Small-Scale Embedded Generation refers to any power system, typically under 1MVA, that generates electricity and operates in parallel with the public grid. This includes residential rooftop solar, small commercial arrays, and other distributed generation systems.

**Key reasons SSEG registration is vital:**

* Ensures safe integration into the grid
* Tracks decentralized energy to support national energy planning
* Enables future benefits like feed-in tariffs, net billing, and grid services

South Africa is not unique—SSEG-like systems exist globally:

* **U.S.:** Distributed Generation with net metering
* **Germany:** Prosumers selling power back to the grid
* **UK:** Microgeneration schemes with export compensation

In each case, registration is a critical precondition for safe and effective integration into national systems.

**More information to be included.**

**2. Regulatory Evolution and Compliance Timeline**

SSEG regulation formally accelerated in 2023 following South Africa’s worst year of load shedding. Eskom’s February 2025 clarification confirmed that all grid-tied solar systems, including those not feeding power into the grid, must register with Eskom or their local municipality.

**Compliance Deadline: March 2026**

* Applies to all systems up to 50kVA
* Penalties for non-registration may include fines, disconnection, or denied access to future incentives

**More information to be included.**

**3. Case Studies: How SSEG Registration Works in Practice**

**City of Cape Town: A Model of Efficiency**

* Fully online application portal
* Digital proxy generation and instant approval-to-install
* Entire process completed in **2–3 weeks**

**Impact:** Sets a benchmark for municipalities nationwide. Reduced paperwork and quick turnaround have enabled widespread adoption without delay.

**City of Tshwane: Digital Presence, Slow Execution**

* Online portal exists
* Delayed confirmations and limited support channels
* Inconsistent tracking post-submission

**Impact:** Despite digital tools, lack of resourcing causes delays and uncertainty.

**Theewaterskloof Municipality: Manual, Costly, and Opaque**

* Paper-based forms
* Application fee: R1,600
* Inspection fee: R800
* Additional unadvertised charges post-approval (e.g., R2,828)

**Impact:** Disincentivizes compliance due to surprise costs and poor transparency. Slows transition in rural and semi-urban areas.

**[Insert bar chart: Comparative SSEG Registration Timeframes by Municipality]**

**More information to be included.**

**4. Cost Implications for Solar Users**

**Eskom Customers:**

* Registration fees waived until March 2026 (for systems <50kVA)
* No current inspection fees

**Municipal Customers:**

* Highly variable
* Ranges from R0 to R3,000+
* Lack of consistency leads to confusion and uneven adoption

**[Insert pie chart: Distribution of Common Municipal SSEG Costs]**

**More information to be included.**

**5. Intersection with Homeflex Tariffs and Smart Energy Management**

Eskom has also mandated a shift to **Homeflex** time-of-use tariffs for solar customers. This ties directly into SSEG registration and sets the stage for smart grid interaction.

**Homeflex Tariff Breakdown:**

* **Peak:** High rates (mornings/evenings)
* **Standard:** Mid-range rates (daytime)
* **Off-Peak:** Lowest rates (late night)

**Implication:** Customers must strategically manage energy use. This creates new demand for AI-driven energy management tools that optimize battery charging and appliance usage to avoid high-peak costs.

**[Insert line graph: Sample Homeflex Cost Curve vs Standard Usage]**

**6. Industry Recommendations**

To streamline SSEG registration and support widespread adoption:

1. **Standardize documentation** across all municipalities
2. **Digitize application processes** with real-time status tracking
3. **Cap or waive registration fees** for systems below a defined size
4. **Align Homeflex rollout with customer education** and support tools
5. **Invest in municipal capacity** for inspections and processing

**[Insert flow diagram: Ideal SSEG Registration Workflow]**

**7. Outlook: From Compliance to Opportunity**

While initial concerns around SSEG centered on administrative burden and cost, the long-term view is more optimistic. Properly implemented, SSEG registration enables:

* Bi-directional metering and feed-in credits
* Smarter grid visibility and forecasting
* Improved safety and consumer protection

As SSEG becomes normalized, municipalities and Eskom must evolve to support it—not hinder it. This means rethinking business models, integrating solar into long-term energy strategy, and promoting a consumer-first energy transition.

**8 Ensuring Fair Tariffs and Transparent Regulation for SSEG Customers**

**More information to be included.**

The continued growth of Small-Scale Embedded Generation (SSEG), particularly rooftop solar PV and storage, presents a critical opportunity to decentralise energy generation, reduce reliance on constrained grids, and empower South African households and businesses. However, the current regulatory and tariff environment—especially at the municipal level—risks penalising rather than incentivising this transition. Disparities such as those in the City of Johannesburg’s 2024 tariff proposal, where postpaid electricity users face fixed charges of R1615 per month compared to R230 for prepaid users, highlight structural inequities. These inconsistencies not only undermine customer trust but also create significant financial disincentives for SSEG adoption, particularly for postpaid users who are already contributing a higher share to grid costs. This chapter outlines a consolidated set of recommendations for municipalities, Eskom, NERSA, and SAPVIA, aimed at creating a fair, transparent, and cost-reflective framework for SSEG customers. These proposals are designed to ensure that no customer overpays simply because they’ve chosen to invest in clean energy solutions, and that the regulatory environment enables—not obstructs—the adoption of decentralised energy.

**8.1 Harmonise Fixed Charges Between Prepaid and Postpaid Tariffs**

Municipalities must address the significant gap in fixed charges between postpaid and prepaid customers. These disparities are not based on actual cost-to-serve and amount to unjustified discrimination. Fixed charges should be harmonised across prepaid and postpaid tariffs to reflect true costs and ensure equity.

**8.2 Introduce a Prepaid SSEG Tariff Class**

Municipalities should develop a dedicated prepaid SSEG tariff class that includes bi-directional metering, smart load tracking, fair feed-in provisions, and time-of-use pricing options. Currently, prepaid customers often lack access to smart meters or the ability to export power back to the grid, limiting the value of their solar and storage investments.

**8.3 Streamline and Digitise SSEG Registration and Metering**

Administrative inefficiencies continue to slow down or prevent the approval and connection of compliant SSEG systems. To address this, municipalities should implement a standardised, user-friendly digital platform for SSEG registration and approval, and prioritise the rollout of compatible meters to support SSEG, especially for prepaid users.

**8.4 Implement Net Billing and Compensation for Grid Support**

Customers who feed energy back to the grid or reduce peak demand through batteries or smart usage should receive appropriate compensation. Municipalities and Eskom should implement net billing frameworks or performance-based feed-in tariffs that reward grid-friendly customer behaviour.

**8.5 Establish Eskom as a National Tariff Benchmark**

As the largest electricity supplier, Eskom has a critical role to play in setting national standards for fairness and cost-reflectivity in SSEG tariffs. Eskom should model transparent, equitable SSEG tariffs that municipalities can adopt.

**8.6 Enforce Cost-Reflectivity and Equity Through NERSA**

NERSA should develop and enforce regulatory guidelines ensuring municipal compliance with cost-reflectivity and equity principles. These should include requirements for fair fixed charges and a justifiable methodology for SSEG-related tariffs.

**8.7 Ensure Transparency and Public Participation in Tariff Design**

Consumers must be informed and included in tariff decisions that materially affect their energy costs and investment incentives. NERSA should require municipalities to publicly disclose tariff methodologies and assumptions and provide meaningful public participation processes for all tariff changes impacting SSEG customers.

**8.8 Standardise Feed-in Tariff Guidelines Across Jurisdictions**

A lack of national guidance has led to inconsistent and often punitive feed-in tariff structures across municipalities. NERSA should issue a national guideline for feed-in tariffs, covering pricing, export limits, metering requirements, and reconciliation processes.

**8.9 Publish a National SSEG Tariff Scorecard**

To increase transparency and accountability, SAPVIA should publish a national SSEG tariff scorecard ranking municipalities by fairness, accessibility, and support for embedded generation. This would highlight leaders, expose laggards, and create healthy pressure for reform.

**8.10 Launch a Public Awareness and Education Campaign**

SAPVIA should launch a public education campaign, including simple bill comparison tools and guidance for registering and optimising SSEG systems. Informed customers are more likely to engage with SSEG opportunities and advocate for fair treatment.

**8.11 Convene a National Regulatory Roundtable**

To ensure alignment between national policy, regulatory frameworks, and municipal implementation, SAPVIA should convene an annual roundtable with NERSA, SALGA, Eskom, municipalities, and private sector stakeholders to align on SSEG policy, regulatory direction, and implementation best practices.

As South Africa strives to address its energy challenges, the role of customer-owned solar PV and storage will only become more vital. Yet, this potential can only be realised if customers are treated fairly and regulations support—not hinder—their participation in the energy transition. The recommendations outlined in this chapter offer a practical, principled approach to unlocking this value, ensuring customers are not overcharged, and building a future where decentralised energy forms a trusted, efficient, and equitable part of the national grid.