Democratising our energy future: Municipal Procurement of Own Renewable Energy Assets

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Abstract:

The traditional linear electricity value chain in South Africa is transitioning to decentralized generation, with increasing investment in distributed networks. Municipalities, government closest to the people, are tasked with efficient service provision and local economic development. Recent trends show that municipal generation via rooftop and ground-mounted solar photovoltaic systems for self-consumption is underway in several municipalities. This 'behind the meter' generation aims to reduce municipal facility operation costs and demonstrate leadership in national emissions reduction commitments. Municipalities are also increasingly exploring utility scale (medium-sized) generation projects, often integrating battery energy storage systems (BESS), to bolster energy security and resilience against loadshedding. This may also offer opportunities to 'buffer' municipalities against fluctuating prices, or price spikes, in a future market.

This paper emphasizes the importance of municipal involvement in the emerging energy economy and explores its feasibility in three South African municipalities: Greater Tzaneen (GTM) in Limpopo, Steve Tshwete (STLM) in Mpumalanga, and Kouga in the Eastern Cape. It discusses the active engagement of the municipalities in leveraging renewable energy, identifies their motivations, and examines challenges hindering project adoption. Drawing on international best practices, the paper will provide direction on key elements of a 'Public Procurement Framework' (PPF) which aims to provide regulatory and technical guidance for municipal own generation procurement in South Africa.

1. Introduction

An energy transition is underway throughout the globe with a shift from fossil fuels to renewables for electricity generation. In South Africa, this transition has meant reduced reliance on the monopoly power producer, Eskom, as decentralized / distributed generation soars. This is seen through rapid uptake of embedded generation at residential and commercial levels[1], as well as the penetration of Independent Power Producers (IPPs) into the market. The role of citizens in the energy transition has become a key focus of the *just* energy transition discussions. As local government, municipalities have the constitutional responsibility to ensure sustainable and efficient service provision to communities and promote local economic development[2]. Additional legislation also provides municipalities with the

[1] https://www.sseg.org.za/salga-status-of-eg-report-2023/
[2] Constitution of the Republic of South Africa (108 of 1996), Section 152(1)

authority to procure new generation[3], further motivating for sustainable electricity generation at local level.

Municipalities have been partaking in this emerging energy economy through own generation via rooftop and ground-mounted solar systems for self-consumption. To build resilience against loadshedding, municipalities have also been exploring utility scale generation with battery energy storage systems (BESS). Nevertheless, not many projects have been developed to date. This paper will highlight the role of municipalities in adopting and leveraging renewable energy and exploring the factors preventing uptake, and contribute practical steps to creating an enabling environment for implementation. There is ongoing debate about the roles of the public and private sectors within the energy transition – and a just energy transition. Against this background, it seems valuable to enable municipalities, as government closest to the people to have a stake in the new energy market.

This paper draws on the experience within the UK Pact-funded Municipal Own Generation Programme, led by SALGA and implemented by Sustainable Energy Africa in partnership with three South African municipalities[4]. The programme aims to demystify municipal own generation by unpacking and addressing its complexities and building capacity to ensure readiness for procurement. The approach is to walk together with the partner municipalities to carve a process for own generation in South African municipalities.

Ultimately, a Municipal Own Generation Procurement Framework (PPF) Guide will be developed, fed by local and international best practice, and emerging factors from the work with the partner municipalities. The work builds on the procurement guideline for PV assets[5] developed in 2016 but expands this to address municipal readiness prior to the procurement phase. The PPF Guide will bridge the gap between planning and procurement by creating a plan to achieve readiness and a viable environment for successful implementation in municipalities.

2. Establishing municipal readiness for own generation

Assessing municipal readiness for the implementation of own generation projects is a crucial first step. Municipalities must be in a viable position, both technically and financially, to increase chances of success and to reap the expected benefits. The following factors were considered as indicators of municipal readiness for the successful procurement of own generation assets:

- Staff capacity and willingness to undertake the work
- High-level buy in from Municipal Leadership and Management
- Plans for municipal own generation renewable projects
- Small-scale embedded generation process in place
- Financial good standing
- Energy losses not exceeding 12%[6]. If exceeding, process in place to reduce losses
- Available land and / or allocated buildings / facilities for the installation

For municipalities having challenges with any of the ‘readiness’ areas, such as revenue collection or high energy losses, efforts should ideally be diverted towards addressing these challenges before developing renewable energy projects. Similarly, municipalities with limited local energy resources may need to consider rooftop PV systems on municipal buildings before launching into larger utility-scale generation. The idea is to build in-house readiness and capacity and ensure that municipalities’ financials are in good shape to fully experience the benefits of own generation. An ideal municipal

[3] Electricity Regulations Act, 2006: Amendment of Electricity Regulations on New Generation Capacity, 2011
[4] The selection was based on the municipalities’ low energy losses indicating high revenue recovery, willingness to participate in the just energy transition and undertake renewable energy projects, capable staff to lead projects, and available resources (such as municipal land). The motivation for STLM also lay in its location at the heart of fossil fuel electricity generation to support the integration of renewables into the grid.
[5] A Guideline for cost-efficient procurement of photovoltaic assets, CSIR (2017)
[6] Cost of Supply Framework and Pricing Methodology for Electricity Distributors in South Africa, NERSA (2023)

environment for implementation would be one with relatively low energy losses, capable and committed staff to lead projects, and available resources (roof space or municipal-owned land).

The process of embarking on municipal energy projects is best done in a holistic and integrated manner. This requires establishing the motivation for engaging in municipal energy projects – what will 'hook' the political and administrative leadership to ensure success and starting where you are: working with the resources at hand and integrating the work into municipal systems. This approach is to be formalised with the development of a PPF Guide that outlines a step-by-step process for municipal own generation, drawing on local and international experience. The elements of the PPF Guide are outlined in Figure 1 and explained in detail in the sections below.

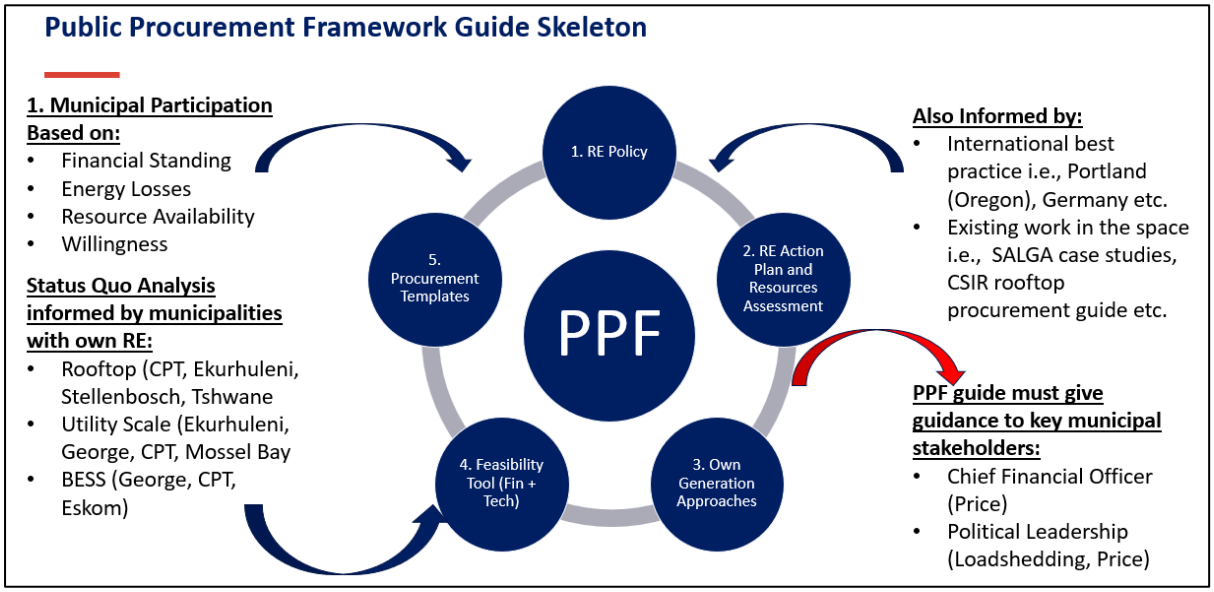

Figure 1: Public Procurement Framework Guide elements

3. Best Practice for municipal own generation

Electricity generation at the local and municipal level has been common practice for centuries throughout the world. Although some municipalities have relinquished this power to monopoly producers, many others have managed to either retain or regain a stake in the electricity market. What is emerging is the democratisation of energy defined by the creation of a more accessible, equitable, and participatory energy sector for all people. This is witnessed through increasing distributed energy generation, the integration of renewables into the electricity mix, growing calls for energy accessibility especially to previously disadvantaged groups, and the participation of the public in energy decision making. Consequently, re-municipalisation or the re-empowerment of municipalities to provide critical electricity services is gaining traction globally with the role of local government and citizens in energy generation being clearly defined in legislation.

In developing the PPF Guide, the first step was to gain an understanding of the building blocks for successful municipal own generation globally and harvest local experience. This explored the motivations, enabling environments, challenges, and impacts to develop a framework for South African municipalities.

3.1. International

Many municipalities in countries like Germany, Denmark, Canada, and the United States of America have been successfully generating their own electricity. The concept of re-municipalisation is witnessed in Germany where the liberalization of the energy sector in 1998 allowed municipalities to regain control over the management of the local distribution networks and supply of electricity to customers. This was

after municipalities relinquished control to the private sector due to financial difficulties resulting in the inability to continue providing the service. Consequently, municipalities have become the default electricity providers and able to sell nationwide.

The motivations for municipal own generation vary between countries but are all centred around increasing dissatisfaction with private electricity generators, advocacy for electricity generation from renewable sources, opening the energy sector up to allow for meaningful public participation, and the balancing of power scales through the economic empowerment of municipalities. This has resulted in the creation of an environment that encourages citizen engagement in selecting preferred electricity suppliers based on the source of generation and electricity price.

At the heart of successful municipal own generation in these countries lies strong regulatory and policy frameworks[7] for own generation. These overarching frameworks support the incorporation of renewables into the electricity mix to reduce carbon emissions and enable municipal operation of own energy generation facilities. Most importantly, the policies are developed and supported at national and provincial level and make provisions for financial support for municipal decentralized energy generation projects. Municipal investment in renewable energy generation is also encouraged through national laws that guarantee the provision of feed-in tariffs for renewable energy producers including municipalities, as in Germany and Canada.

The legislation also caters for the role of citizens in local electricity generation through community cooperatives and municipality-public partnerships. Denmark's Energy Agreement and Canada's Community Energy Planning Frameworks support community-based energy projects. These efforts display political commitment and support for municipal own generation, including the associated financial support. The development of these frameworks creates a conducive environment for project development, leaving only municipal readiness to drive projects towards implementation.

3.2. Local

The emerging energy market in South Africa necessitates considerations for the role of government as a participant. Municipalities like the City of Cape Town and City of Johannesburg previously owned and operated their own power stations. To date, Eskom and the private sector dominate the country's large-scale electricity production. However, in recent years, municipalities have been participating in the sector by self-generating via rooftop and ground-mounted solar PV systems. Motivations for this decentralized clean generation vary from the need to contribute to climate change mitigation efforts, reducing reliance on Eskom and ultimately reducing bulk purchase costs, and building loadshedding resilience through the integration of BESS. Detailed interviews with local municipalities provided insight into core elements for success and major hurdles to be addressed.

Understanding the motivations behind municipal own generation is important to determine the appropriate approaches, including the magnitude and sizes of these generation systems and get the buy in of key stakeholders. The main motivations for the procurement of own generation assets in South African municipalities are to reduce reliance on Eskom and bolster energy resilience considering the plight of loadshedding. There is a consensus to contribute to climate change mitigation efforts by diversifying the energy mix and using the opportunity to decentralize energy governance in South Africa. Energy democratisation is also being explored to establish the feasibility of low-income and unelectrified community participation in renewable energy. This is being done through the rollout of solar home systems and most recently investigating socially owned renewable energy where citizens participate via municipality-public partnerships. Across the study, only the City of Cape Town indicated interest in building market readiness with own generation holding the potential to buffer price volatility. This is not yet a concern of smaller municipalities who may not engage the market directly – or have not yet considered the implications of 'market readiness'. Overall, the motivations speak to the key concerns and interests of municipalities, but municipal participation remains scattered with no national framework or provision of support.

[7] Germany's Renewable Energy Sources Act, Denmark's Energy Agreement and Municipal Energy Plans, Canada's Community Energy Planning Frameworks

The critical enablers for project implementation were the existence of overarching municipal energy strategies outlining municipalities' plans for own generation. This required a strong level of political support and Council approval for renewable energy projects, given the high-cost implications and prioritisation of other municipal projects. As a result, it is critical to ensure alignment between energy strategies and municipal Integrated Development Plans (IDPs) to obtain stakeholder approval and budget allocation.

The main challenge encountered with project implementation was securing funding, either from municipal coffers or external sources. These projects require upfront capital to cover feasibility studies and fund processes for environmental and rezoning authorizations for project sites. In South Africa, the lack of frameworks supporting the just energy transition and associated funding has created hurdles for municipalities to procure own generation assets.[8] Other challenges include obtaining support from all stakeholders amid other pressing local government service investment demands. The success of own generation projects rests on both political and municipal willingness to move towards implementation.

Some of the realised impacts of municipal own generation include cost savings from reduced Eskom purchases, and the capacitation of municipal staff to manage renewable energy projects. The results from interviews with municipalities are provided in Appendix 1.

4. Developing a Municipal Own Generation Public Procurement Framework (PPF) Guide

Building on the readiness criteria and best practice for municipal own generation, the following PPF Guide elements are proposed as the fundamental building blocks for creating an own generation enabling environment in municipalities. Sections 4.1 to 4.3 focus on achieving institutional readiness through policy development and strategic planning, while Section 4.4 onwards outline the steps for procurement after a project has been identified.

4.1. Renewable Energy Policy

The purpose of a Renewable Energy Policy is to display a municipality's standpoint on renewable energy. It serves to outline the motivation – why the municipality wishes to engage with renewable energy development – and the various renewable technologies that a municipality intends to adopt. This Policy undergoes extensive stakeholder engagement before approval by municipal Council. Policy development as a step towards own generation procurement signifies municipal buy-in and support for the incorporation of renewables into the energy mix.

A template Renewable Energy Policy has been developed for the three partner municipalities and will soon be available for general use. The Policy covers municipal plans for own generation, small-scale embedded generation, embedded generation for systems larger than 1MW, electricity wheeling, and IPP procurement.

4.2. Incorporation of own generation into IDP

Integrated Development Planning is at the heart of municipal operations as "the principal strategic planning instrument that guides and informs all planning, budgeting, management and decision-making in a municipality."[9] The Municipal Systems Act mandates the preparation of an IDP by municipal council for their five-year service tenure, with annual reviews. At the heart of IDP preparation is stakeholder engagement to ensure that the needs of communities are addressed through future development plans.

Municipal IDPs are cross-sectoral, addressing various needs. These needs can range from electricity to housing, and from water to recreation. Following this, resources must be mobilised and allocated for each planned activity. The importance of incorporating own generation into a municipality's IDP is to:

[8] Municipalities are reluctant to apply for funding that dictates the suppliers they should appoint for these projects.
[9] Integrated Development Planning (IDP) Template, 2012 (https://www.westerncape.gov.za/text/2013/April/integrated-development-planning-template.pdf)

(i) Present projects to stakeholders and ensure that there is agreement on its necessity and how it will benefit the municipality,
(ii) Motivate the huge (upfront capital) financial costs associated with such renewable energy projects, and
(iii) Ensure that resources are provided to achieve success.

In the case of the City of Cape Town's Atlantis Solar Farm project, challenges were encountered with stakeholders questioning the selection of an own generation project instead of buying from an IPP given the cost implications and associated risks. The City also had to substantiate reasons for the project over other burning community needs such as the provision of free housing. This highlights the importance of stakeholder engagement for project buy-in and ease of implementation. Projects need to be of value to the community and the municipality must be able to demonstrate why a renewable project 'makes sense'. This also fulfils the element of community participation envisaged in energy democracy.

4.3. Electricity and Energy Planning

Developing and executing a strategic energy plan empowers local governments to deliver reliable, cost-effective energy that is both sustainable and environmentally responsible. This can be accomplished by establishing a long-term energy vision and mission, along with clear goals and targets aimed at increasing energy capacity, enhancing grid resilience and strengthening, boosting energy efficiency, and expanding renewable energy use. The plan should also include the implementation of policies and regulations that support these objectives and encourage innovation and technology transfer.

Moreover, strategic energy planning offers additional advantages, such as reducing greenhouse gas emissions, improving air quality, bolstering energy security, and generating jobs and economic opportunities within the renewable energy sector. It also enhances the resilience of local communities to energy disruptions. In essence, strategic energy planning is a vital element of sustainable development, playing a critical role in achieving long-term economic growth, environmental sustainability, and social well-being.

Strategies need to be evidence based. The key technical studies for the development of energy strategies include determining the energy baseline, needs assessment, resource assessment and energy plans with associated projects (such as own renewable energy) to achieve a least-cost energy mix. These studies must provide a broad direction for the municipality within which specific projects can be selected for implementation.

4.4. Feasibility Study

Once a municipality has established plans for incorporating renewables into its energy mix through its renewable energy Policy, IDP and Electricity / Energy Masterplan and Strategic Plans, a feasibility exercise can then be followed for an identified own generation project. This project should be one of the projects listed in the municipality's energy plan and a part of the modelled future least-cost municipal energy mix.

The purpose of a feasibility study is to determine the viability of a project considering legal, environmental, technical, and financial factors. Regulation 5(3) of the 2020 Amendment of Electricity Regulations on New Generation Capacity (2011) states that a feasibility study must be conducted for the procurement of new generation capacity. These studies are a requirement for utility scale generation projects, especially when external funding is being sought.

Reference is made to the CSIR Guideline which provides a methodology for the procurement of PV assets. The PPF Guide will work in conjunction with the CSIR Guideline for procurement. The following steps are suggested for the feasibility process:

4.4.1. Project energy demand and supply assessment

The energy demand that needs to be supplied by the proposed municipal own generation site should be ascertained. This energy demand could be for an individual municipal-owned building (own consumption) or a portion of the municipality's total demand (utility scale).

The availability of resources i.e., wind, energy, waste etc. as outlined in the energy resource study are key parameters to determining the appropriate sizing for the renewable energy site and performance. This assessment should inform the municipality that the project will achieve its intended objective, contribute to the municipal energy mix and have compliant integration onto the municipality's electricity grid.

One of the partner municipalities is currently developing a feasibility study for a 20MW solar plant. Although this is a positive step towards implementation, the foundation has not been laid through an established energy plan. Municipalities should approach energy projects holistically by ensuring they implement projects that feed into the strategic energy plan.

4.4.2. Background / base-level permitting

Different types of renewable energy technologies have different permitting requirements that must be adhered to. Examples include environmental assessments, geotechnical studies, land use permitting etc. for ground mounted PV systems.

4.5. Procurement Process

After the conclusion of a feasibility study, the municipality may then move towards procurement. Three contracting models were considered for own generation procurement:

(i) Build-Own-Operate-Transfer (BOOT)

Under a BOOT model, a municipality contracts with a private entity to design, construct, finance, and operate the facility for a set period. At the end of the operation / contract period, the facility is then transferred to the municipality.

Municipalities are often keen to explore public-private partnership (PPP) under the BOOT model due to the exemption from securing funding for the project. In this case, a contractor would assume all risk associated with planning, financing, operating and maintaining the facility. Although this model has been successful in other government projects[10], this model is not encouraged in the electricity space due to its complexities and limited exploration within municipalities. Some of the challenges encountered with PPP model include:

- High likelihood to be blocked by trade unions
- High costs for contractor to assume all risks
- Time consuming to manage and monitor
- Possible budget overruns, material defects, delays, and structural design risks arising during the construction phase

(ii) Build-Transfer-Operate (BTO)

Under a BTO model, a municipality finances the project and contracts with a private entity to design and build the facility. Ownership of the asset is transferred to the municipality only at the end of construction, then a contractor is compensated for facility operations and maintenance.

Under this model, a municipality may contract different entities for design-build and for operation and maintenance. This may be detrimental to a municipality if design-build defects arise after asset transfer, possibly resulting in halted facility operations due to administrative, legal and technical challenges with fixing the defects.

[10] For example, the Gautrain Rapid Rail Link which is a PPP with the Gauteng Government and the Mbombela Concession Company that provides efficient high speed rail linking Johannesburg, OR Tambo international Airport and Pretoria.

(iii) Design-Build-Operate (DBO)

Under a DBO model, the municipality finances and owns the facility and contracts with a private entity to design, build and operate. The employer retains ownership of the asset throughout the duration of the contract, and the contractor never has ownership of the facility.

Contrary to the BTO, under the DBO model the municipality contracts a single entity to design-build and operate the asset. This is beneficial for ensuring that the same contractor responsible for design-build remains liable for any defects that may arise during facility operation. The DBO model also makes way for simplified operations throughout the facility's life and cushions municipalities from risks. It is for these reasons that the DBO model is the most preferred for the procurement of municipal own generation assets.

4.6. Contracting Templates

Three contract templates for municipalities have been developed by law firm Pinsent Mason to support a municipal generation procurement process:

- a Design-Build-Operate (DBO) Contract;
- an Engineering, Procurement and Construction (EPC) Contract; and
- an Operation and Maintenance (O&M) Contract (refer to Table 1).

The Fédération Internationale des Ingénieurs-Conseils ("FIDIC") Conditions of Contract were utilised for both the DBO and EPC contracts. Although municipalities usually utilise the General Conditions of Contract (GCC) form for engineering and construction work contracts, the FIDIC standard form contract provides a clear framework for managing the project, which reduces the risk of disputes and misunderstandings between the parties. The mechanisms under FIDIC also ensures that the project is completed on time and within budget because the contract outlines the timeline and cost of the project. Lastly, it anticipates and caters for numerous scenarios that are commonly present or most likely to arise in the execution of own generation project.

The GCC in its standard form is an ideal document for dealing with civil, mechanical, electrical and building projects, whereas the FIDIC Gold and Silver Books are better suited for turnkey projects for process and power plants. If the GCC had been used for the DBO and EPC contracts, changes would have had to be made, ultimately changing its underlying principles and contract regime. For this reason, the FIDIC General Conditions of Contract are the most ideal.

Table 1: Contracting templates developed for municipal own generation procurement

DBO Contract	EPC Contract	O&M Contract
FIDIC Gold Book Contract conditions for new, built-from-scratch projects.	FIDIC Silver Book / Turnkey Contract conditions.	National Treasury, Government Procurement: General Contract conditions.
Single contracting entity (DBO Contractor) to design, construct and operate asset over an agreed period.	EPC Contractor fully responsible for the design, engineering and construction of the facility, while the municipality is not involved in day-to-day project management.	For when a municipality decides to procure its own generation asset by using an EPC Contract.
Asset transferred to municipality at the end of operational period.	Asset transferred to the municipality at the end of construction for operation and maintenance.	The municipality pays the operator a fee for operation and maintenance services.

A municipality may select to procure using either a DBO Contract where a single DBO Contractor is responsible for the design, build and operation of the facility for an agreed period, or a combination of EPC and O&M contracts when the intention is to appoint separate contractors for design-build and for operation. DBO Contracts are likely to work better for larger, ground-mounted systems to protect

municipalities from associated risks, whereas EPC and O&M contracts would be better suited for smaller, rooftop systems.

5. Conclusion

The role of local government in the emerging energy market cannot be overlooked. It is particularly important in the democratisation of the energy sector where the roles of municipalities and communities in electricity generation are being explored. Although some municipalities have managed to leverage from renewable energy to reduce reliance on Eskom and bolster energy resilience, many others have not taken part due to institutional and financial challenges. The Municipal Own Generation Support Programme aims to provide technical support to municipalities to increase capacity for own generation. A PPF Guide, highlighting the building blocks essential for building municipal readiness, will be developed for use by all South African municipalities wanting to procure own renewable energy generation assets.

At the forefront of renewable energy project development is building municipal readiness. It is critical to ensure that municipalities are in good financial standing and have in-house capacity to host these projects. Municipalities are to also develop the necessary policies and strategic plans encouraging own generation. Notwithstanding the benefits of utility-scale generation, municipalities should also consider small projects due to lower entry level requirements and project costs, and to realise the benefits before upscaling to bigger projects.

International best practice for municipal own generation points to the importance of establishing national frameworks that encourage and support the incorporation of renewables into the energy mix, especially at municipal level. These frameworks also outline funding support available to municipalities for project implementation. The Just Energy Transition investment framework offers an important opportunity for this scaling up of support to the energy democratisation project.

Lastly, considering the opportunities the just energy transition presents for democratising the energy sector through fostering active community participation, local and national frameworks should also address and explore the opportunity for communities in municipal generation. This could be done through municipality-public partnerships involving the use of commonage land to establish shared own generation facilities, or the establishment of community cooperatives where communities generate electricity for selling.

Appendix 1

Results from own generation interviews with South African municipalities

Objectives	Process / Enablers	Challenges	Impact
George Municipality			
- Enhance energy resilience - Reduce demand on Eskom - Feasible alternative to IPP procurement	- Cross-sectoral municipal *Strategy*: *To build a resilient city* - Council approval of Strategy - Strong political support simplifying operations - Municipal budget alignment with IDP - Funding (coffers + loans) - Feasibility Studies - Environmental authorizations - Simple EPC contracting process - Team willingness - Appointment of staff for RE projects - Available municipal land	- Funding for system with BESS - EIA hurdles - Administration and political buy-in - Meaningful stakeholder engagement	- Owned by municipality if funded through coffers - Energy savings (in line with payback periods) - Internal capacity building & upskilling - Employment opportunities for local solar pv installers
City of Cape Town (7MW Atlantis Solar Farm)			
- Diversifying municipality's energy mix (resilience) - Buffer against rising energy costs + price volatility - Loadshedding resilience - Climate change mitigation - Stimulating green economy - Decentralizing energy governance	- *2050 Energy Strategy for the City of Cape Town* - Strategy includes future energy plans for city owned RE assets - Alignment of Strategy with municipal IDP - Authorizations - Feasibility Studies - EPC + Operation & Maintenance contracting	- Allocating budget for RE projects amid other pressing needs - Justifying project over signing power purchase agreement with IPP - Financial feasibility	- The project is still under construction
City of Ekurhuleni			
- Reducing reliance on Eskom - Loadshedding resilience	- Integrated Energy Plan	- Theft and vandalism of infrastructure	- Savings on monthly Eskom bill of over R2M (own generation

	- Budget allocated for 500kV systems annually - No feasibility studies for rooftop installations - Senior buy-in (municipal management + Council) - 3-year EPC contracting	- Limited roof space for panels - High cost of ground-mounted systems	assets + energy efficiency measures)
Mossel Bay			
- Plants with BESS for energy security during loadshedding - Reducing average electricity purchase cost	- Energy resilience part of the energy strategy in the IDP - Council buy-in due to high project costs - Internal on-boarding with Finance unit and Council - EIA - Feasibility studies to secure loan funding - Appointment of experienced consultants	- Battery technology employed in first plant is not the best	- Training of staff to operate and maintain the plants - Cost of electricity now predictable and savings can be achieved - When loadshedding ends, plans can be adapted for energy arbitrage opportunities in Eskom TOU tariffs