
# BUSINESS MODELS FOR ACCELERATED RENEWABLE ENERGY DEPLOYMENT

A paper presented at 68th AMEU Convention 2022,

held from 2-5th October 2022 at the

Durban International Convention Center

Hosted by

eThekwini Metropolitan Municipality

**Author: Refilwe Mokgosi**

**Pr. Tech Eng., Cert Eng., SMSAIEE, MBL**

Executive Director: Public Works Emfuleni Local Municipality

# Business Model for Accelerated Renewable Energy Deployment

Author: Refilwe Mokgosi

Pr. Tech Eng., Cert Eng., SMSAIEE, MBL

Executive Director: Public Works Emfuleni Local Municipality

## Executive Summary

The aim of this papers is to provide an approach for municipalities on what to consider in order to accelerate the deployment of renewable energy programmes within the highly regulated municipal environment and energy space.

This paper will look at municipalities that have started the independent power producers (IPP)/Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) processes. What they did, and how long did it take them as well as what can be learned from it.

It will further address the following questions that arose with all the announcements and developments from government from last year, (2021) to address broad energy challenges that are facing South Africa.

These questions include, among others.:

1. Are Municipalities ready?

    a) Are we structured properly as municipalities to deliver IPPs? Organisationally.
    b) Municipalities are you ready? Do you know what to do? Capacity – Research, Resources, Skills, and Personnel.

2. How does the current legislation enable the stakeholders in the energy sector? What risks come with these deemed opportunities?

    a) National legislation, Municipal Sector and Energy Sector.
    b) Can the Provincial and Local municipal level legislate different? Setup different structures from national prescripts?

## 1. Introduction

Due to the growing importance of renewable energy globally to address energy needs and improve environmental impact, countries have taken bold steps in reviewing their Energy Resource Plans. In South Africa, we face energy crisis already, and the government has to step-in. With the President announcing that the regulations would be changed to also allow the municipalities to procure power independently, it calls for a need to effectively accelerate the deployment of Renewable Energy in the municipalities and practically do away with single-generator dependency.

It is trite that the current Eskom challenges would require a total overhaul in the models to deliver sustainable and environmentally friendly energy. The transition to the anticipated state needs careful implementation as the impact on industry can have adverse effects to the country. These can range from depletion of government revenues, unsustainable Local government and economic collapse for the big industries that are highly dependent on base load supply. These big industries account for the highest employment numbers in the Country, especially in Gauteng Province.

The figure A below shows that almost 50% of the highest employers are intensive energy users and are highly dependent on electricity for them to thrive in their sectors.

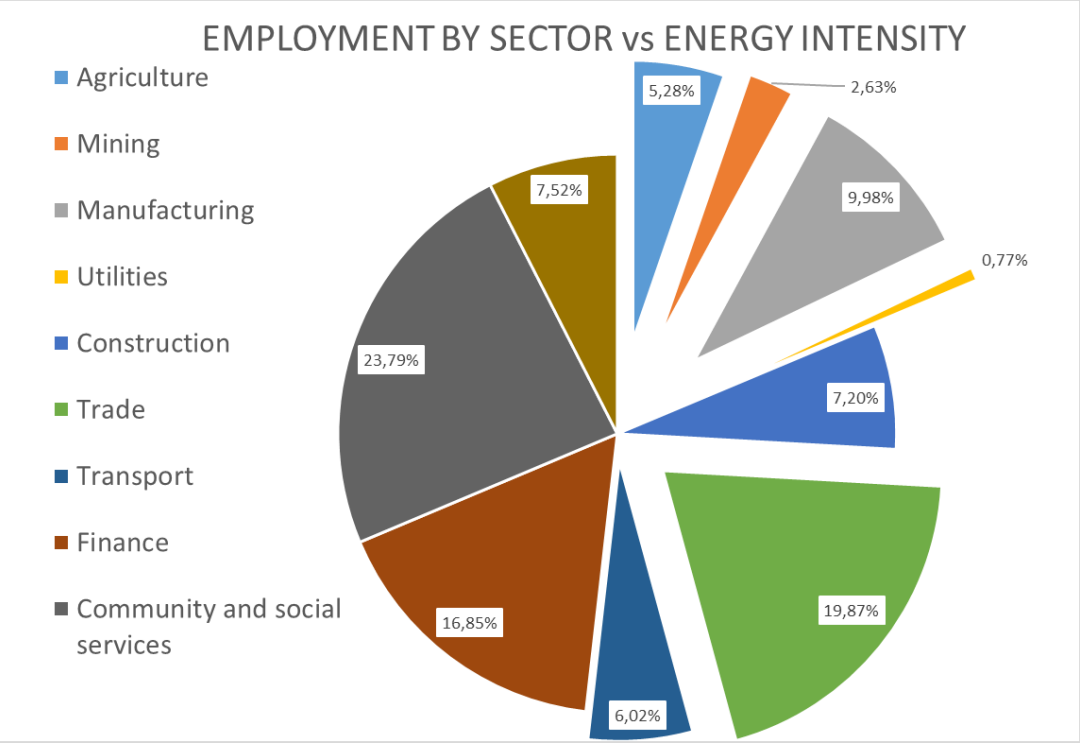


*Figure A: STATS SA: Quarterly Labour Force Survey, Quarter 1: 2021*

Municipalities, as utilities, account for employment of high number of workers. In their sector, many of them are running the energy business with unsustainable models.

This is evident through the debt that municipality owe to their two biggest debtors, Eskom and Water Utilities. In Gauteng Province the utilities being Rand Water and Eskom. Water debt stands at about R5bn and Eskom debt at R8.8bn as of 31st July 2022 in the province. The municipal debt is exacerbated by the cross-subsidisation of services and functions at the municipal level.

## 2. South African Energy Landscape

**Policy background [4]**

a) National Development Plan (NDP) 2030:
   - NDP guides that South Africa (SA) must invest in a strong network of economic infrastructure to support its economic & social goals.

b) Integrated Resource Plan (IRP) 2019:
   - The IRP 2019 supports a diverse energy mix and sets out nine policy interventions to ensure the security of South Africa's electricity supply.
   - The IRP affirms that coal power is set to be replaced by Renewable Energy.

c) Renewable Energy Independent Power Producer Procurement Programme (REIPPPP): [5]
   - REIPPPP is a programme designed to respond to the call by the NDP & the IRP via Renewable Energy sources.
   - The programme was developed by Department of Mineral Resource and Energy (DMRE).

**National Renewable Energy Programmes**

In 2009, Government began exploring feed-in tariffs (FITs) for Renewable Energy, but these were later rejected in favour of competitive tenders. As result a program, now known as the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) was introduced in South Africa at competitive prices. [3]

The REIPPPP is a competitive tender process that was designed to facilitate private sector investment into grid-connected Renewable Energy (RE) generation in South Africa. [1] Independent Power Producers (IPPs) are invited to submit bids for onshore wind, solar photovoltaic (PV), concentrated solar power (CSP), small hydro, biomass, biogas or landfill

gas projects. REIPPPP is aimed at bringing additional megawatts onto the country's electricity system through private sector [2]. Between 2011 and 2015 four of such bidding rounds have been completed, referred to as Bid Windows, with an additional round for CSP only. [9]

The programme is steadily progressing towards achieving the National Development Plan's (NDP) interim target of adding operational RE generation capacity and to the IRP target.

The Department of Mineral resource and Energy (DRME) also introduced the Small Projects IPP Procurement Programme (SP-IPPPP) in 2013, which aimed to procure 200 MW from projects of only 1 - 5 MW each. This programme intents to be simpler and less expensive for bidders to encourage participation from small and medium enterprises (SMEs) in South Africa, which are often unable to compete effectively with larger players. [9]

The Department (DMRE) announced the amended Request for Proposal (RFP) to increase the MW allocation under the REIPPPP Bid Window 6 in response to the announcement by the President on 25th of July 2022. The capacity to be procured under BW 6 will now increase from 2600MW to 4200MW.

## 3. Municipal Environment: Status of IPPs in Municipalities

During the presidential address on energy crisis on the 25th of July 2022, the President made announcements that were, among others, aimed at fundamentally transforming the electricity sector and position it for future stability. It was therefore inevitable that municipalities would not be affected by such an announcement and in particular, to the municipalities the announcement states and I quote "We also changed the regulations to allow municipalities to procure power independently. Our second priority is therefore to accelerate the procurement of new capacity from renewables, gas, and batteries."

It is clear that, as much as this announcement brought opportunities for the municipalities it also brings new challenges and risk to the municipalities. Among the challenges brought to the fore is municipal readiness and another risk is how can the municipalities protect their revenue.

In general, only a few municipalities have started IPP process. The below is the progress on IPPs within the Gauteng Province:

### a) City of Ekurhuleni Metropolitan Municipality (COE)

The City of Ekurhuleni will soon receive between 150 MW and 680 megawatts of additional power from Renewable Energy sources. According to the municipality's annual report for 2020/21, it awarded tenders to Independent Power Producers (IPPs) to generate additional capacity through Renewable Energy for the city. [6]

The bids were received for Renewable/Clean technologies and the ones considered were Solar PV, Waste to Energy, Landfill Gas, Gas, Fine Coal Gasification and Kinetic Power Production. CoE is currently in process of signing Power Purchase Agreement (PPA) with appointed IPPs and has developed a wheeling framework.

In the initial studies, several observations identified primary risks which required mitigating steps to be put in place. The table shows the risk and the mitigation:

**Table 1: Risk and Mitigation [10]**

| Risk | Risk Mitigation |
|---|---|
| • Long term contracts<br>• Deemed energy payments | • Adequate skills and proper programs to run the project<br>• Setting up accurate hours for allowable grid unavailability period based on stability of the grid – to avoid deemed payments<br>• Connecting IPP generators on stable grids<br>• Avoiding load shedding IPP generators integration substations |
| • Litigation | • Proper dispute resolution process to avoid litigation |
| • Regulations uncertainty | • Continuous engagement with relevant stakeholders |

**Lessons learned [10]**

These are the important lessons learned through observation within the municipalities that have started the process:

- Benchmarking against Eskom Megaflex tariff might not always be best practice. Megaflex is volatile and difficult to predict.
- Start with small but fundable projects.
- A fundable PPA will attract investors.
- Good Credit rating of municipalities can aid PPA fundability.
- Good Eskom payment history can also aid PPA fundability.
- Proper PPA risk allocation.
- Land – Scarcity of land in Metropolitan areas.
- Explore PPPs for electricity generation from Municipal landfill sites with gate fees.

### b) City of Tshwane Metropolitan Municipality (CoT)

The City of Tshwane is currently conducting an intensive study including full network study to establish how the municipality wants to procure Renewable Energy.

As part of the CoT strategy for Renewable Energy, the Member of Mayoral Committee for Utility Services made statement that CoT is open to all sorts of solutions and that the task team will be formed to cast the net as far and wide as possible, so that they can see what options are available in the market. [7]

### c) City Power

The City of Johannesburg says it plans to partner with Independent Power Producers (IPPs) on a R26-billion electricity investment strategy, which is designed to end load-shedding and place City Power on a more financially and environmentally sustainable footing. The strategy involves a diversification of electricity sources away from Eskom, which currently provides the city with 90% of its power, while also securing City Power's revenue, which was currently threatened by grid defects, theft and the prospect of a "utility death spiral". [8]

City Power has done a lot of background studies on energy sustainability strategy, accessed different types of business, whereby their alternative energy strategy is being pursuit in two-fold approach the Self Generation projects and Independent Power Producer Programme. Also, that they will be unlocking prosumer (wheeling and SSGE) to enable energy trading through their own network.

### d) Sedibeng District

- Emfuleni LM – The municipality is still exploring options and in process of acquiring approval from Council to advertise Request for Proposals (RFPs).
- Lesedi LM – The municipality is still exploring options and in process of acquiring approval from Council to advertise RFPs.
- Midvaal LM - The municipality already has a Council approval to advertise RFPs

### e) West Rand District

- Merafong City - The municipality is still exploring options.
- Mogale City - The municipality is still exploring options.
- Rand West City – The municipality has appointed a consultant to investigate legality and develop a framework.

From the environmental scan above it means the metros are leading in accelerating the deployment of IPPs. The clear distinction between metros and other municipalities is brought by their organisational alignment to focus and deliver such mandates.

In the City of Ekurhuleni, the city has a department that deals with Energy. This configuration ensures that there is a focused division that is led by the Divisional Head with requisite human capital support for engineering and technical aspects relation to Renewable Energy.

In the City of Johannesburg, the city has City Power in place and City Power has developed the requisite human capital on engineering aspects as well as legal aspects.

City of Tshwane has the structure that has a designated Director to deal with Renewable Energy. This assists the city to focus on RE programmes.

In the other two districts in the Gauteng Province, the process to deploy IPPs have still not commenced and only in two of the six municipalities, their councils have resolved to undertake programs to deploy IPPs. These municipalities jointly account for massive energy supply in the province.

This is absolute contrast when comparing the metros to the other municipalities which do not have dedicated units within their organisational service delivery models. For starters, this situation begins to create dependency on external consultants. Municipalities have over years proved that they do not have good knowledge management and skills-transfer programmes when using consultants. There is already a risk that their programmes will not be sustainable.

## 4. Business Model Considerations

### Municipal functions as per the Constitution Part B of Schedule 4

Currently municipalities are exclusive licence-holders to distribute electricity in specific jurisdictions. They have the rights to the revenues within these areas.
The current legal framework makes more provision for national regulation than other spheres of Government. This means that current business model is centred around national Government. The current law does not prohibit nor limit our customers when installing Renewable Energy for their own use.

### Key Legal Instruments

There are key statutes that will affect all planning for accelerated deployment of Renewable Energy models, along with associated regulations:

They are:

- Constitution of the Republic of South Africa, 1996 (“Constitution”)
- Electricity Regulation Act 4 of 2006
- Local Government: Municipal Finance Management Act, Act 56 of 2003 (“MFMA”)
- Preferential Procurement Policy Framework Act, Act 5 of 2000 (“PPPFA”)
- Local Government: Municipal Systems Act, Act 32 of 2000 (“Systems Act”)
- Local Government: Municipal Structures Act, Act 117 of 1998 (“Structures Act”)

There are other areas of regulation that will be relevant to the implementation of Renewable Energy strategies. These include property legislation, environmental legislation, data protection legislation, taxation and legislation relating to technical standards.

**Renewable Energy Regulatory Environment**

National Treasury undertook, a legal and regulatory framework analysis with respect to the establishment or procurement of new generation capacity by municipalities and municipal entities.

The analysis culminated in the promulgation of MFMA Circular no.118 of 14 June 2022, which aimed at providing advice to municipalities and municipal entities relating to the legal framework for procurement of new generation energy capacity, particularly from Renewable Energy sources, within the provisions of the Constitution, MFMA and other related legislation.

The key output from the analysis can be summed up with the criteria of scenarios stated on the table below for Municipal Independent Power Producers Procurement (MIPPP) road maps. These scenarios are fully detailed by Annexures stipulated in MFMA Circular no.118 of 14 June 2022, step by step.

Table 2: Scenarios

| SCENARIO | DESCRIPTION |
|---|---|
| Scenario 1 | MIPPP with a Ministerial Determination |
| Scenario 2 | MIPPP in which the municipality is both procurer and buyer |
| Scenario 3 | MIPPP based on PPP requirements |
| Scenario 4 | MIPPP based on developing and operating own power plant |
| Scenario 5 | MIPPP based on developing and operating own power plant |
| Scenario 6 | A multi-buyer scheme and municipal power pool arrangements |
| Scenario 7 | Unsolicited bids |

The factors to be considered in the business models are examined inclusive with core power systems economics considerations.

**Cost of Supply studies**

Municipalities should look at unbundling tariffs to consider all cost associated with the supply. This must specifically cover each method of generation that is deployed through the various options available internally and externally through IPPs. The greatest risk remains that of long-term contracting within an undeveloped regulatory framework. The impact on the ever-dynamic technological and legal environment could be detrimental to sustainability.

**Renewable Energy Supporting Considerations [5]**

**a) Feed-in Tariffs**

The key feature of a feed-in tariff is a guaranteed payment of a fixed (minimum) price per kilowatt-hour (kWh) to renewable energy power producers. The most relevant design criteria for an effective feed-in tariff are:

- Guaranteed and preferential grid access and dispatch of electricity from renewable energies
- Sufficient minimum feed-in tariffs
- Legal security for beneficiaries, as for instance the amount of feed-in tariffs guaranteed by law over a sufficient period over which the tariff is paid (at least to amortize investment cost; preferably it should cover the lifetime of the equipment)
- Individual feed-in tariffs for each renewable energy technology.
- Cost reduction potential (digression).

**b) Renewable Portfolio Standards or Quotas**

Quota obligations, also called renewable obligations or renewable portfolio standards impose a minimum share of RE in the overall electricity mix. Governments can impose this obligation on consumers, retailers, or producers of power. A quota obligation system is often combined with tradable green certificates. Financial support for the producers of RE electricity is often provided through penalty payments that parties need to pay in case of non-compliance.

**c) Tradable Renewable Energy Certificates**

Renewable energy quota obligations often use tradable renewable energy certificates (REC) as additional feature to stimulate cost efficient solutions among renewable portfolio standards/ quotas. Obligated parties (e.g., utilities) generate renewable energy certificates for the amount

of kWh produced. If more electricity from renewable energy sources is produced above the minimum requirements of the quota, exceeding certificates can be sold to other parties which have not yet fulfilled their quota targets. This is attractive when the certificate price is lower than:

• the development cost for own projects and

• the penalty for non-compliance, i.e., ideally least cost options for RE electricity deployment are developed first.

**d) Net Metering**

Net metering aims at encouraging customer investment in renewable energy technologies. Usually, it entails small renewable energy facilities, e.g. photovoltaics (PV), wind and home fuel cells. “Net” refers to the basic mechanism: electricity meters record both electricity consumption and electricity provision by consumers. What remains after deductions (electricity surplus or consumption) is the basis for the actual electricity bill. This way, consumers can balance their consumption and production of electricity and end up with a balanced account (and thus a balanced bill) or even receive a retail credit. This credit can either be billed on a monthly basis or include a monthly roll over of kWh credits.

Municipalities have an opportunity to assist in the development of the business opportunities (industrial activities), since it is the core of Local Economic Development. Its proximity to the people provides it with a great opportunity to understand the requirements and they should utilise that advantage in timeous response to the needs.

**Partnerships**

Businesses are located in communities in which municipalities are the ones expected to deliver services. It is therefore imperative for the concept of partnerships be encouraged, to minimise duplication of activities and encourage efficiencies. The partnership should be designed to ensure a win-win approach as a key outcome.

The proposals below are some of the practical options that can be pursued.

**Enabling through legal instruments:**

The engagement with national treasury for the amendment of the MFMA is key, to enable municipalities to enter into some commercial activities presently not allowed. One approach is to encourage the establishment of businesses that support the production and assembly of components needed in the building of the renewable products (e.g. solar panels). The incentive is to allow those business to operate at reduced rentals where the

municipalities have land or properties available to rent. This be coupled with reduced municipal rates and taxes and incentivised tariff charges on trading services.

**Built environment:**

The municipalities should make available their building roof-tops and parking-lot roofs to be used to generate power through the installation of solar panels, the model will be for the private sector providing and installing these and all the excess power generated be supplied to the grid, a payment model will have to be developed with the private sector to ensure that it is compensated. Currently, Eskom has been engaged to provided land adjacent to its power stations in this regard, targeting to include up to 1800MW on its grid. Some metros in Gauteng have already started and it encourage that all municipalities do the same.

**Technology research and development:**

The municipalities especially, those who are in close proximity with the university to collaborate with them to use some of their properties for pilot technologies being developed with the undertaking that, once they are successful and in full production, the municipality will have the first right of refusal in taking over the project commercialisation stage.

**Prosumers:**

One option is to allow the residents (including businesses) to self-generate energy (even though the municipality will lose revenue, however its communities will have energy to function and then it can redirect resources to proving other services).

**Private Sector Collaboration:**

Where feasible their development of micro-grids should be encouraged so that the excess energy generated can then be redirected to schools, or other public facilities. This will be possible in municipalities with big businesses (e.g., mines). The municipality should play a collaborative role to avoid duplication of services.

In all the above initiatives the municipalities do not have to lay out capital, private sector can play a role through a PPP approach.

## 5. Conclusion

The main result of the study consists of business models that municipalities can apply to accelerate the renewable energy deployment. The practical examples structured mapping of individual municipalities success in introducing the IPPs in their business. This is supportive to strategic considerations on setting focus in the unbundling of tariffs, and on how to prioritize further potential activities.

For the municipalities that have not yet commence the process it is imperative to engage those municipalities that have started.

With these municipal business models, we need to expect more regulations to be promulgated in the energy space. This will affect what municipalities must consider to improve their current environments and mitigate future risks. It is also important that all other stakeholders (DMRE, COGTA, SALGA, NERSA, NT) must play their role to ensure that municipalities are enabled to enter the IPPs contracts.

## 6. References


[1] https://ppp.worldbank.org/public-private-partnership/library/south-africa-s-renewable-energy-ipp-procurement-program-success-factors-and-lessons-0#:~:text=The%20South%20African%20Renewable%20Energy,RE

[2] https://www.gov.za/about-government/government-programmes/renewable-independent-power-producer-programme

[3] https://openknowledge.worldbank.org/handle/10986/20039

[4] http://www.energy.gov.za/files/PPMO/2018/Outlining-the-REIPPPP.pdf

[5] https://www.icafrica.org/fileadmin/documents/Knowledge/GIZ/Legal%20Frameworks%20for%20Renewable%20Energy.pdf

[6] https://www.google.com/search?q=ekurnileni+municipality+renewable&oq=ekurnileni+municipality+renewable&aqs=chrome..69i57.12823j0j15&sourceid=chrome&ie=UTF-8

[7] https://ewn.co.za/2022/08/24/city-of-tshwane-admits-it-s-still-at-the-drawing-board-with-ipps

[8] https://www.engineeringnews.co.za/article/joburg-aims-to-partner-with-ipps-on-r26bn-electricity-investment-strategy-2022-05-23

[9] https://www.gsb.uct.ac.za/files/REIPPPPReview_2017.pdf

[10] Hendrick Rendani, City of Ekurhuleni, AMEU/SAIEE joint virtual webinar "*THE DIGITAL MUNICIPAL Dx ELECTRICTY UTILITY OF THE FUTURE*" 23 August 2022, (Case Study), Effective DER Procurement Systems & Processes: