

IN THE SHADOW OF LOAD SHEDDING: AN OVERVIEW OF THE MUNICIPAL ELECTRICITY DISTRIBUTION CRISIS

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HIGHLIGHTS

- Ageing and poorly maintained municipal infrastructure has led to frequent power outages, exacerbating the electricity crisis beyond national load shedding.
- Municipal arrear debt to Eskom has grown exponentially, now standing at R90 billion.
- Electricity markups and price disparities result in inequities across residential and commercial customer classes.
- Excessive non-technical losses have reduced electricity revenues threatening other essential municipal functions.
- Innovative solutions must be formulated with an eye towards a fundamentally reformed electricity supply industry.

INTRODUCTION

The need to end load shedding has understandably dominated public discourse in recent years and spurred government action to identify and implement solutions to urgently address the electricity crisis. Several interventions have been operationalised towards this end including the establishment of the National Energy Crisis Committee, Operation Vulindlela, and amendments to the Electricity Regulation Act removing the licensing requirement for embedded generation, among others. While the focus on load shedding and the raft of measures to urgently address it have been crucial, other longstanding

and more insidious crises in South Africa's electricity supply industry (ESI) have been overshadowed – not least of which is the mounting crisis in the municipal electricity distribution industry (EDI).

The crisis is evident in the ongoing failure of many municipalities to provide reliable and affordable electricity at cost-reflective tariffs that ensure their financial and economic sustainability. As with load shedding, this failure has had a profoundly negative impact on businesses, jobs and local economic development. Failing distribution infrastructure, pervasive electricity theft and a culture of non-payment have reduced electricity revenues on which municipalities structurally depend to finance other municipal functions. Reduced earnings combined with the lack of revenue ringfencing has led many municipalities to default on their bulk electricity payments, with municipal debt to Eskom totalling R90bn as at the end of September 2024.¹ This has further compromised the embattled utility's own financial position and, by extension, the national fiscus.

In this context, this short briefing note provides a high-level overview of the key issues in municipal electricity distribution, their underlying causes, and points to a few areas where solutions may be found.

¹ <https://www.eskom.co.za/eskom-serves-notice-of-power-interruption-against-city-of-johannesburg-and-city-power/>

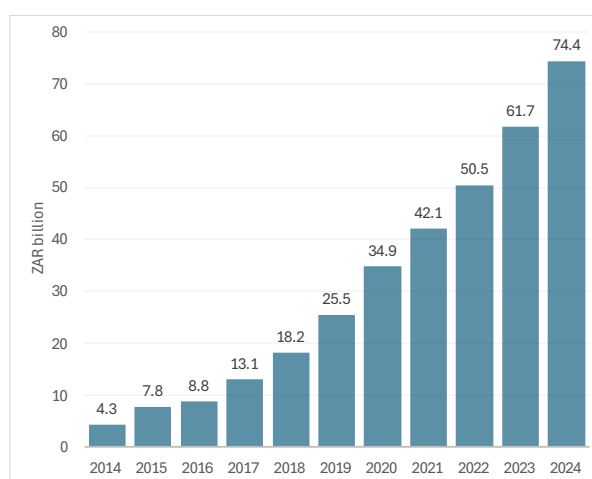


THE MUNICIPAL ELECTRICITY DISTRIBUTION CRISIS

The responsibility for electricity distribution in South Africa is shared between Eskom, which distributes approximately 60% of electricity, and municipalities, which distribute the remaining 40%. Municipalities buy electricity in bulk from Eskom at wholesale prices and sell this on to customers within their jurisdictions at a marked-up retail price. While the revenues generated from these sales should cover the costs of infrastructure maintenance and repairs, as well as bulk electricity purchases from Eskom, many municipalities are failing to fulfil both of these obligations.

Ageing and poorly maintained infrastructure has made electricity distribution increasingly unreliable. Although national load shedding has undermined security of supply for electricity customers, poorly managed and maintained distribution infrastructure is a major cause of power outages in many municipalities. Residents of the City of Johannesburg for example experienced more power outages due to distribution faults between 26 March and 23 April 2024, when load shedding was suspended, than the previous month when load shedding was being implemented.² City Power has since announced that it will be implementing rotational power cuts, termed ‘load reduction’, in order to avoid overloading the distribution network as the existing infrastructure is not equipped to meet peak demand.³ These distribution network failures are not isolated cases with the Minister of Electricity and Energy, Kgosientsho Ramokgopa, calling the collapse of municipal distribution infrastructure ‘the next front’ in the national electricity crisis.⁴

Beyond failing infrastructure, many municipalities are failing to pay their bulk electricity accounts to Eskom. This is a systemic issue with total arrear municipal debt to Eskom having risen seventeen-fold over the past decade from 4.3bn in FY2014 to 74.4bn in FY2024 (see Figure 1). Debt levels continue to rise unabated reaching R90bn at the end of September 2024 with Minister Ramokgopa warning that at the current rate Eskom will be owed R3.1 trillion by 2050.⁵



Data source: Eskom

Figure 1: Inflation-adjusted arrear municipal debt to Eskom from FY2014 - FY2024

Despite the lack of reliable electricity supply in many areas, municipalities apply markups on electricity procured from Eskom which can range from 20 – 150% (Baker & Phillips, 2019). This results in considerable electricity price disparities between different areas for similar customer classes across distributors. A comparison of municipal and Eskom prepaid electricity tariffs in the City of Johannesburg for instance found that the majority of poor and indigent households paid 49 – 76% more than residents in Eskom-supplied

² <https://www.news24.com/news24/southafrica/news/weve-never-had-worse-power-than-now-outages-plague-joburg-but-theres-no-load-shedding-20240424>

³ https://api.citypower.co.za/ftp-service/download-pdf/%7Bfilepath%7D?filepath=Media_Room%2FMedia_Statements%2FCity_Power_implements_load_reduction_in_areas_with_exceedingly_high_usage_levels.pdf

⁴ <https://www.businesslive.co.za/bd/national/2024-05-06-municipal-grid-collapse-next-crisis-front-says-ramokgopa/>

⁵ <https://www.sanews.gov.za/south-africa/municipalities-r78-billion-eskom-debt-urgent-task-ramokgopa>



areas.⁶ These price disparities can also have a severe impact on the competitiveness of firms, particularly those with energy intensive production processes such as foundries which can pay up to 30% more for electricity if purchased from a municipality instead of directly from Eskom (Kaziboni, Rustomjee & Steuart, 2018). Beyond markups, Eskom's electricity prices have increased

dramatically in recent years (see Figure 2), forcing a corresponding increase in municipal electricity tariffs. As a result, many commercial, industrial and residential customers are looking to behind-the-meter alternatives, such as rooftop solar – the capacity of which has more than doubled from 2.3 GW in July 2022 to 5.6 GW in May 2024 (Eskom, 2024).

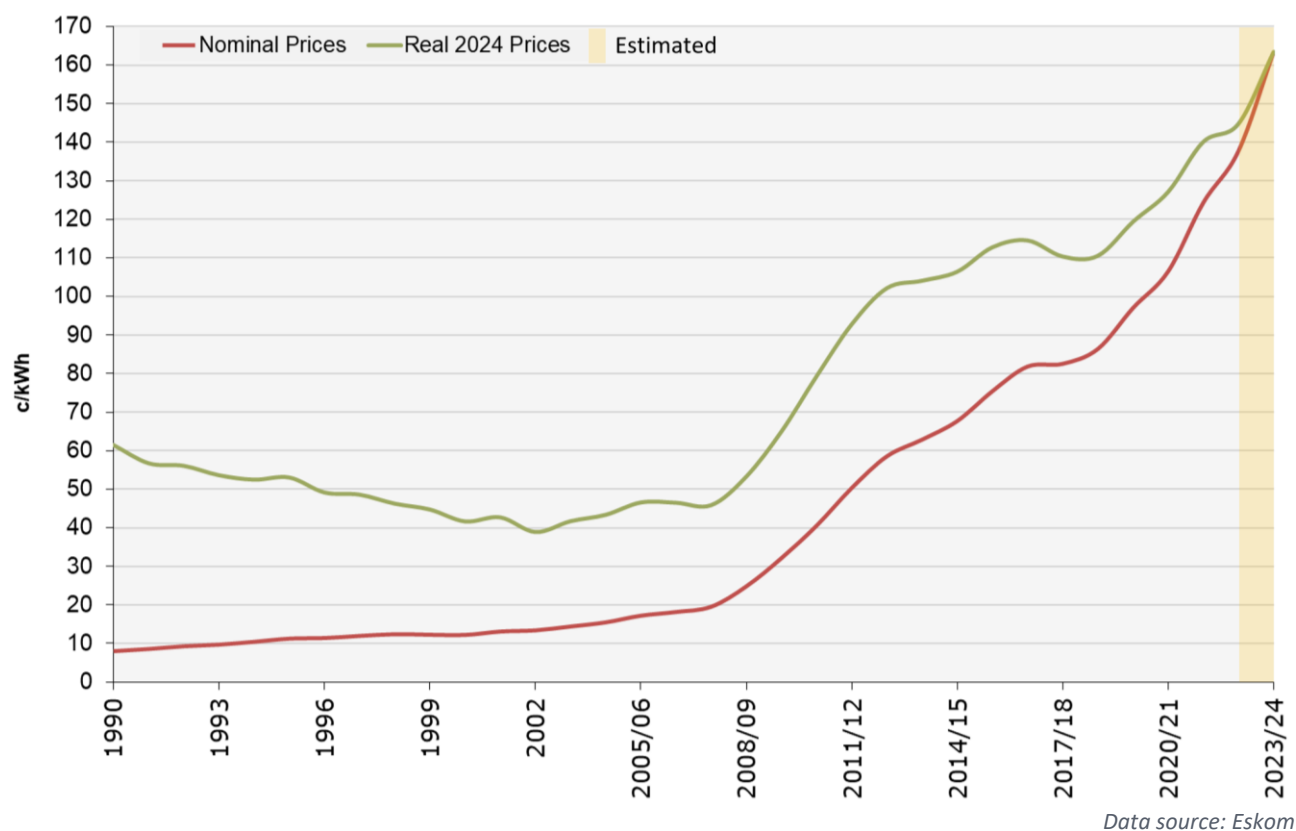


Figure 2: Historic Eskom electricity prices

DEEP-SEATED ISSUES

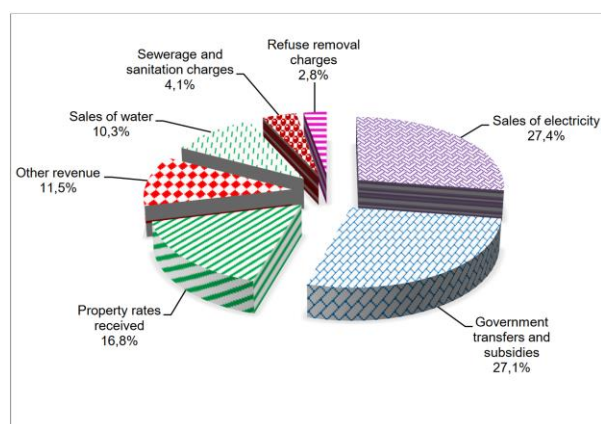
Many of the problems in the municipal EDI stem from a disparity in the statutory responsibilities assigned to municipalities under the Constitution and the financial requirements needed to fulfil those responsibilities. The Constitution gives municipalities executive authority and rights of administration over electricity reticulation as well as the right to generate revenue from these services. While Chapter 13 of the Constitution guarantees municipalities an equitable share of national revenues (determined annually through

the Division of Revenue Act), these national transfers fall far short of total municipal finance requirements with no obligation on national government to assist municipalities that fail to raise revenue commensurate with their fiscal capacity and tax base. Consequently, municipalities are largely dependent on revenues generated through service charges to finance their operations, with electricity making up the largest revenue source (see Figure 3). Revenues generated from electricity sales are used to finance other government functions such as water supply and waste collection. As a result of this lack

⁶ <https://www.moneyweb.co.za/news/south-africa/the-price-of-prepaid-city-power-vs-eskom/>



of ringfencing, many municipalities forgo maintenance and repairs to their distribution network infrastructure and default on their bulk payments to Eskom, choosing to use this revenue elsewhere.



Source: Stats SA (2024)

Figure 3: Disaggregated average municipal revenue for the year ended 30 June 2022.

This dependence on electricity revenues has resulted in a fierce battle for customers between municipalities and Eskom. The South African Local Government Association for instance has gone to court seeking an order granting municipalities exclusive rights to electricity distribution within their boundaries in order to bolster revenues (SALGA, 2024). Eskom, on the other hand, has opposed the application and rejected numerous municipal requests to take over electricity distribution.⁷ Simultaneously, poorly performing municipalities like Emfuleni and Maluti-a-Phofung have been instructed to appoint Eskom as their service delivery agent for electricity distribution due to inadequate service delivery and escalating municipal debt owed to Eskom.⁸

Poor service delivery and revenue management is compounded by the lack of an effective governance and management structure. Currently, responsibility for the technical and financial aspects of electricity distribution are separated across different departments within

each municipality. Technical departments manage the operation, maintenance and expansion of the distribution network, whereas financial departments manage billing, tariff setting and expenditure. This disjuncture creates weak performance incentives and undermines accountability for poor outcomes resulting in a lack of integrated and commercially prudent decision making.

The lack of accountability and performance incentives has contributed to poor financial management linked to the billing and collecting of revenues (AGSA, 2023). According to National Treasury's (2024) Local Government Revenue and Expenditure report, municipalities managed to collect only 61.5% of billed electricity between 1 July 2023 and 31 March 2024 (National Treasury, 2024). This not only highlights the poor financial management within municipalities, but also points to a pervasive culture of non-payment, which contributes to excessive non-technical losses. In the City of Tshwane for instance, electricity distribution losses have averaged around 20% over the past five years, significantly higher than the 10% benchmark set by NERSA (City of Tshwane, 2024). Of these losses, over 70% were of a non-technical nature with errors in management, corruption, negligence, inaccurate metering and theft accounting for losses of over R1.6bn in 2023.

Non-payment is putting considerable strain on municipal balance sheets with consumer electricity debt owed to municipalities totalling R41.3bn as of 31 March 2024 (National Treasury, 2024). This makes up a relatively small percentage of a much larger R347.6bn owed to municipalities across water, electricity, property rates and waste services (73% of which is owed by households). Of the limited revenue that is collected, municipal expenditures tend to prioritise salary payments

⁷ <https://mybroadband.co.za/news/energy/537089-eskom-doesnt-want-to-rush-into-handing-over-municipal-distribution.html>

⁸ <https://www.eskom.co.za/maluti-a-phofung-municipality-and-eskom-work-together-to-restore-sustainability-of-electricity-provision/> and <https://www.citizen.co.za/vaalweekblad/news/2024/10/04/eskom-appointed-as-direct-service-delivery-agent-in-emfuleni/>



over investments in critical infrastructure and payments to creditors. As a result, many municipalities are facing serious financial constraints limiting necessary maintenance and investment in electricity distribution infrastructure. While National Treasury recommends that municipalities allocate at least 8% of the value of their assets for infrastructure maintenance and repair, the Auditor-General (2023) found that 39% of all municipalities spent 1% or less on these expenditures. Chronic under-expenditure has led to a backlog in infrastructure refurbishment and maintenance, currently totalling over R32 billion and increasing by R2.5 billion annually (DPWI, 2022). This lack of maintenance is one of the primary reasons for the poor reliability of many municipal distribution networks leading to frequent supply disruptions.

A further issue stems from the way in which municipal electricity tariffs are determined. Municipalities are responsible for setting their own tariffs, with the National Energy Regulator of South Africa (NERSA) required to regulate and approve these tariffs. However, there is a lack of consistency in how municipal tariffs are set and NERSA oversight has been inconsistent, resulting in significant variations in pricing across regions and customer classes. The key issue is that in many cases municipal electricity tariffs are not determined on a cost-of-supply (CoS) basis. In the absence of transparent CoS studies from municipalities, NERSA has resorted to a 'Guideline and Benchmark' process whereby municipal tariffs are approved based on a generic tariff increase *percentage* each year. Although this has been tolerated by municipal customers for many years, more recent electricity price increases from Eskom have made these inflated tariffs unsustainable. Consequently, two business chambers took NERSA's tariff decision on review to the High Court which found NERSA's guideline and benchmark

methodology to be unlawful due to its lack of cost reflectivity.⁹ While the court suspended the declaration of invalidity for twelve months to allow time for preparation, most municipalities have since failed to submit CoS studies with NERSA once again approving tariffs for the 2024/25 financial year without CoS information.¹⁰ However, the significant costs combined with the technical and economic skills required to conduct thorough CoS studies present a considerable obstacle for municipalities already facing significant skills shortages. Poor financial management, uncompetitive remuneration, inadequate recruitment and political interference have led to high skills shortages particularly for technicians, managers and other professionals critical for service delivery (LGSETA, 2020). These inefficiencies and high electricity prices have incentivised customers to seek alternatives to municipal electricity supply. Increasingly, customers are installing behind-the-meter solutions, such as rooftop solar or diesel generators, to reduce the impact of load shedding/reduction and buffer against rising electricity tariffs. SARS data shows that over R17.5 billion worth of solar cells were imported in 2023 (see Figure 4). This surge is likely due to Scatec's 540 MW Kenhardt solar project, along with a significant rise in rooftop solar installations with Eskom estimating that 2.5 GW of rooftop solar capacity was installed last year.¹¹ This is on top of significant utility-scale installations with Operation Vulindlela (2024) noting a pipeline of confirmed private projects amounting to over 22 GW. In most cases these customers remain connected to the grid, relying on municipal

⁹ <https://lawlibrary.org.za/akn/za-gp/judgment/zagpphc/2022/609/eng@2022-10-20>

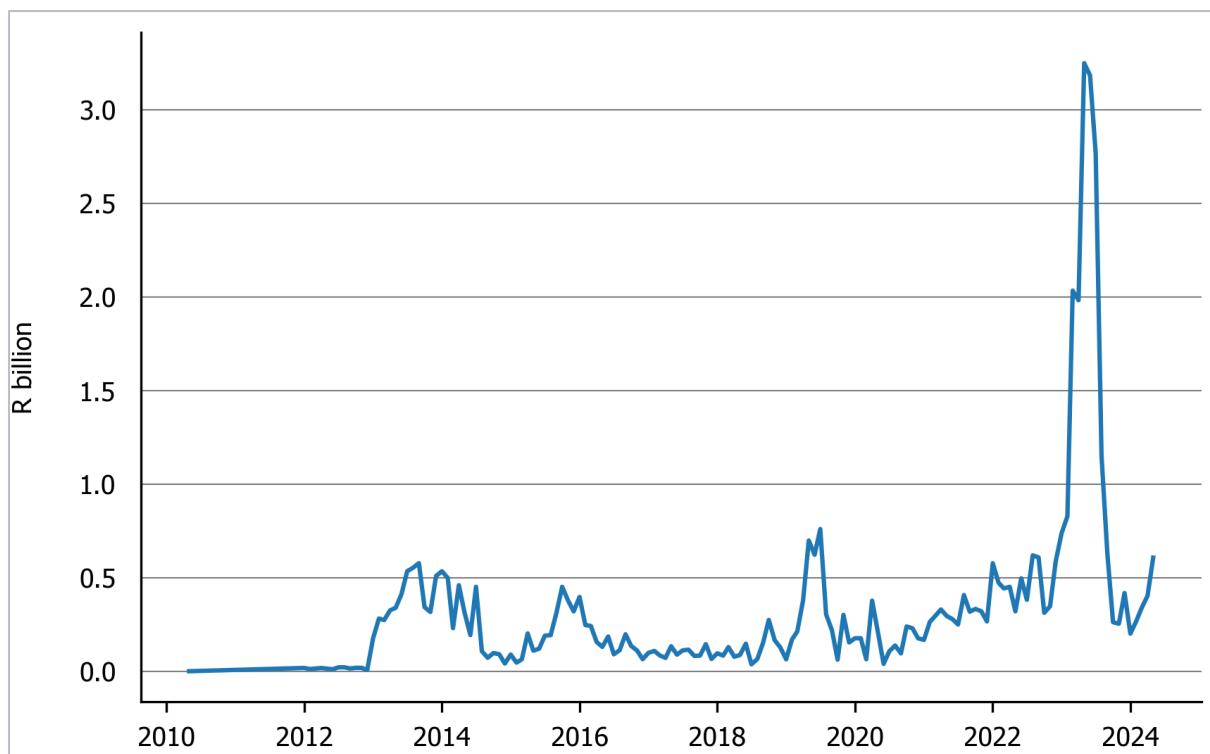
¹⁰ <https://lawlibrary.org.za/akn/za-gp/judgment/zagpphc/2024/625/eng@2024-07-08>

¹¹ https://www.eskom.co.za/wpcontent/uploads/2024/02/Weekly_System_Status_Report_2024_w8.pdf



electricity when solar production is low or when batteries are depleted. Since tariff structures are not cost reflective (with fixed charges either absent or under-recovering and per kWh rates

over recovering), this introduces volumetric risk as municipalities are unable to recover their fixed costs due to declining variable charges (Moshoele, Steenkamp & Sigalelana, 2023).



Data source: SARS

Figure 4: Imports of solar cells

POTENTIAL SOLUTIONS

The numerous challenges outlined above are long standing and attempts to resolve them have been made since the dawn of democracy in South Africa. The 1998 Energy Policy White Paper highlighted several challenges with the EDI. These included: the poor financial health of municipalities, significant price disparities across customer segments, low economies of scale, high distribution costs, elevated tariffs, a culture of non-payment, poor supply quality, reliance on electricity revenues for other municipal services, and municipalities' inability to pay their bulk accounts to Eskom (RSA, 1998). To address these issues, the White Paper proposed restructuring the distribution industry by establishing regional electricity distributors (REDs) to achieve the necessary economies of scale for financial

viability, allowing for privately owned distributors, and adopting cost-reflective tariffs. However, these interventions have largely failed. The multi-million-rand REDs project was shelved in 2010 in large part due to strong resistance from municipalities who feared the loss of electricity revenues as REDs were established. Similarly, efforts to increase private sector participation have encountered strong resistance and many municipalities still do not have cost reflective tariffs.

The High Court states that CoS studies serve a dual function: (1) to ensure efficient electricity distribution, and (2) to ensure a standardised and transparent process that end-users can engage with.¹² Where affordability and efficiency concerns are often foregrounded, increased transparency is essential to inform public debate

¹² <https://lawlibrary.org.za/akn/za-gp/judgment/zagpphc/2024/625/eng@2024-07-08>



and build trust between distributors and end-users. The Electricity Regulation Act of 2006 requires distributors to provide end users with information on the costs imposed on the distribution system. Similarly, the Electricity Pricing Policy concludes that tariffs must be set according to CoS studies with all types of costs shown transparently. CoS information should therefore be made publicly available with NERSA using this information to approve municipal tariffs.

Despite the seemingly intractable nature of these issues, the ESI in South Africa is currently undergoing fundamental reforms that present both challenges and opportunities for the municipal EDI. Historically, electricity systems have been dominated by large, vertically integrated state-owned monopolies (like Eskom) primarily due to the high capital costs and economies of scale necessary to provide affordable power, often in furtherance of strategic industrial development objectives (Gratwick & Eberhard, 2008). However, technological and financial innovations have fundamentally altered the playing field enabling greater participation, competition, and choice within the ESI. When accompanied with appropriate market rules and regulatory oversight, these changes promise increased efficiencies, more sustainable business practices, and lower costs. Government has acknowledged the benefits of this more competitive model with the National Infrastructure Plan stressing the need to improve institutional effectiveness by corporatising electricity governance structures and enabling the effective participation of the private sector through public-private partnerships (DPWI, 2022). This can help bring critical skills and professional management practices to the municipal distribution industry.

Real-world examples of the benefits of private companies assisting struggling municipalities

already exist in South Africa. Mafube Local Municipality in the Free State for example has a 25-year contract with Rural Maintenance, a private electricity and utility service provider, which has been managing and operating Mafube's municipal electricity distribution network for over a decade. While distribution network assets remain the property of the municipality, Rural Maintenance is responsible for distribution and billing. Under this arrangement, technical and non-technical losses have remained below the national utilities benchmark of 10%, R120m has been invested in the network (to be transferred to the municipality at the end of the contract), Eskom bulk payments are up to date, tariff increases have been below those allowed by NERSA, and R22.2m has been paid to the municipality in royalties.¹³ While the exact model used in Mafube may not be replicable across the country due to institutional and legislative constraints, it nonetheless illustrates the potential benefit of expanding the range of EDI service providers, particularly in municipalities struggling with skills shortages and operational inefficiencies. Additionally, if service delivery agreements with private service providers can be coordinated across municipalities, it may be possible for a single service provider to manage distribution networks over a much larger region. These networks can represent 'virtual REDs' that allow distributors to recover costs across a much larger pool of customers, maximising efficiencies and ensuring financially viable service provision.

This regional approach can be further facilitated by district municipalities that can coordinate and initiate joint initiatives among local municipalities to address common electricity challenges. The roles and responsibilities of district municipalities are set out in the Municipal Systems Act (MSA) of 1998 with their primary purpose being the achievement of integrated, sustainable and equitable social and economic development. Their functions include responsibility for the bulk supply

¹³ <https://www.citizen.co.za/business/sa-towns-where-electricity-is-privatised/>



of electricity within their jurisdiction and building capacity for local municipalities in performing their service delivery obligations. Where smaller local municipalities lack skills or capacity, district municipalities can therefore step in to provide technical assistance. In severe cases where the provision of basic services collapses or is likely to collapse, the MSA provides for the temporary transfer of local government functions to the district municipality. District municipalities therefore have the potential to both facilitate coordinated distribution services within their jurisdictions and help capacitate or temporarily assume responsibility for service delivery where local municipalities are failing.

As outlined above, grid defection and behind-the-meter solutions such as rooftop solar PV pose an immediate threat to municipal revenues. This is emblematic of broader changes within the ESI as electricity grids are increasingly decentralised. Rather than resisting this inexorable shift, municipalities need to adapt their revenue models to these new market realities. While a long-term solution ultimately requires a reconsideration of the prominent role electricity sales play in municipal revenue streams and a shift to cost-reflective tariffs, electricity wheeling presents a near-term solution that can allow customers greater choice over their electricity supplies while preserving municipal electricity revenues. Unlike behind-the-meter solutions, wheeling retains the use of existing municipal distribution infrastructure, ensuring that municipalities continue to earn revenue from grid services.

However, there are several challenges with existing wheeling frameworks. Currently traditional wheeling in municipal networks requires altering Electricity Supply Agreements (ESAs) between municipalities and Eskom. This is particularly problematic given the fraught relationship between Eskom and many municipalities that are in arrears on their bulk

electricity accounts. Integrating wheeling transactions into municipal billing systems also presents a significant technical obstacle, as many municipalities lack the necessary skills and capacity. While Eskom's proposed 'virtual wheeling' framework eases some of these administrative and technical burdens, customer participation will likely be limited due to exposure to default risks, as they are required to make a double payment (to the IPP/aggregator and the distributor) before receiving a cash refund from Eskom. This refund may not be forthcoming if a municipality is in arrears on its bulk account, or if Eskom is unable to pay given its own financial difficulties.

These hurdles can be overcome with the use of Electricity Credit Tokens (ECTs).¹⁴ The ECT system derisks payment for electricity through credit tokens representing vouchers for wheeled electricity, which customers can use to settle a portion of their municipal electricity accounts. Municipalities in turn can use these tokens to pay their bulk electricity accounts to Eskom while continuing to charge a markup that allows them to fund other municipal services. Since ECTs cannot be used for any other purpose than settling electricity accounts, the risk of default (both from Eskom and municipalities) is considerably lower than both traditional and virtual wheeling frameworks. This will not only reduce risk for end users but also for Eskom whose exposure to municipal non-payment will reduce as the portion of token-backed power supplied to each municipality increases. Furthermore, unlike traditional wheeling, since ECTs are used in the settlement (payment) systems as vouchers, municipal billing systems do not require any changes. This system reduces financial risks, administrative burdens, and improves market flexibility compared to alternatives where transactions are complex, slow, and risk prone. The ECT system thus promotes a more efficient,

¹⁴ <https://meridianeconomics.co.za/our-publications/oiling-the-wheels/>



transparent, and accessible electricity market that gives customers greater choice while retaining revenues for municipalities.

CONCLUSION

The current structure of the municipal EDI is unsustainable. The failure to address deep-rooted issues has resulted in a growing crisis that is hindering economic development and compromising the delivery of public services. Viable solutions should not only address the root causes identified in this briefing note but be formulated with an eye towards a fundamentally reformed ESI characterised by greater competition, private sector participation, increased distributed generation, and the introduction of a wholesale electricity market.

While some solutions such as allowing for greater private sector participation and the introduction of ECTs can be introduced without fundamental

changes to the existing structure of the municipal EDI, longer term structural reforms will be necessary to ensure a sustainable municipal financial model with cost-reflective electricity tariffs. Government has acknowledged this need with President Ramaphosa announcing that the second phase of Operation Vulindlela will include a “focus on reforming the local government system and improving the delivery of basic services.”¹⁵ While navigating the complexities of these reforms will be challenging, the urgency for action cannot be overstated and will necessitate a collective effort across national government, municipalities, civil society and the private sector. By prioritising long-term reforms that create a more competitive, diversified, and financially robust electricity sector, municipalities can unlock their economic potential and ensure equitable access to a reliable power supply for all their citizens.

¹⁵ <https://www.parliament.gov.za/news/second-phase-operation-vulindlela-will-launch-soon-says-president>



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