Economic Research Southern Africa

Unlocking sustainable and inclusive growth in South Africa: Advancing the electricity reform agenda

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1. Introduction

South Africa continues to face deep structural bottlenecks to growth, including weaknesses in the business environment, limited workers' employability and access to jobs, and persistent inefficiencies in key network industries such as transport, water, and electricity. These challenges are underscored in the 2025 Economic Survey of South Africa, released in June 2025. Although notable progress has been made under Operation Vulindlela, significant obstacles remain, including within the electricity sector (OECD, 2025). Electricity is a foundational input for economic activity, central to firms' production decisions and to the functioning of the broader economy. This note examines how restoring energy security, accelerating renewable deployment, and reforming municipal and pricing structures can stimulate growth and support a just and sustainable green transition.

Why address electricity now, as loadshedding has declined and Eskom is recovering? First, loadshedding remains a potential risk, and with relatively moderate growth, there are concerns about the system's capacity to meet rising demand if growth accelerates. Second, then it is likely that electricity availability has a significant impact on growth. In that case, the risk of loadshedding is also a key component of the business environment: uncertainty over reliable supply continues to influence investment and operational decisions.

South Africa's electricity sector has been under stress for more than 15 years, marked by chronic supply shortages, financial instability at Eskom, and rising costs for households and firms. Rolling power cuts—load shedding—have become a defining constraint on the economy. An Eskom study estimates that outages between 2007 and 2019 cost ZAR 43.5 billion in terms of GDP losses. Between 2020 and early 2023, the losses surged to ZAR 224 billion, or 1.2% of cumulative GDP over that period (Kay, Nel and Kiln, 2023)

While load shedding declined sharply in 2024, falling to 69 days, supply remains fragile. Seven of Eskom's 18 power stations operate below 60% capacity, and the average age of the coal fleet is 41 years. Demand growth will expose these weaknesses further if economic activity accelerates. Electricity's importance goes beyond keeping lights on. The sector is also South Africa's largest source of greenhouse gas emissions, responsible for 41% of national emissions due to its 80% reliance on coal. Decarbonising electricity is therefore the key to meeting climate goals, while also determining the country's competitiveness as trade partners link market access to carbon intensity. (Denmou, 2025)

This dual impact of the electricity sector, as both the economy's bottleneck and its heaviest emitter,makes reform urgent. With effective policies, electricity could shift from being South Africa's Achilles' heel to a driver of growth, investment, and a just green transition.

2. Electricity as a foundation for growth, inclusiveness and Decarbonisation

A reliable electricity supply underpins growth, industrialisation, and household welfare. South Africa's experience shows how fragile supply erodes economic potential.

2.1 Growth and productivity impacts

Unreliable electricity continue to depress South Africa's output by hampering firm productivity, capital utilisation, and investment, with small firms hit hardest. Exceptionally high load shedding in 2023 is estimated to have reduced GDP growth by 1.5 percentage points, leading to sluggish growth of 0.7% The impact has been estimated at 0.7 and 0.5 percentage points for 2022 and 2024 (SARB, 2024). Macro-econometric models find macro effects of higher order of magnitude, with load-shedding cutting annual growth by roughly 2.3% (NERSA, 2021; Nova Economics, 2023). Costing studies converge on large rand losses: cumulative damages are placed in the tens to hundreds of billions of rand, with higher stages of load-shedding inflicting exponentially greater economic costs through diesel expenditures, spoilage, and schedule disruptions that lower productivity (TIPS, 2022; NERSA, 2021; Nova Economics, 2023). Recent evidence from a synthetic control analysis further strengthens the view that load-shedding has imposed a persistent slowdown on South Africa's economic performance. Koch and Nkuna (2025) construct a counterfactual benchmark for comparable countries with stable electricity supply and estimate that, from 2008 to 2023, load-shedding reduced South Africa's real GDP per capita by an average of 0.9% to 2.1% annually, with the impact peaking at 3.4% in 2023.

Sectoral syntheses track these mechanisms into concrete output declines across primary and secondary industries (Investec, 2023), while broader reviews highlight knock-on effects on employment, health, and education that further erode human-capital-driven productivity (Naidoo, 2023). Although SARB (2024) notes that headline GDP occasionally outperformed expectations despite record outages—reflecting adaptation via self-generation, demand-side shifts, and composition effects—these adjustments are costly and uneven, implying widening firm-level disparities. Indeed, overall growth slowed to just 0.7% in 2023, with potential growth having fallen from almost 4% in the 2000s to around 1% today (OECD, 2025, Investec, 2021; Walsh et al. 2020), largely due to electricity insecurity. Energy-intensive industries such as mining, manufacturing, and transport face rising costs and declining competitiveness, while small firms are disproportionately affected, with limited means to invest in backup power—leading to closures and job losses (SARB, 2023; SARB, 2024).

These repeated electricity disruptions have become one of the biggest drags on South Africa's economic potential. Average growth, which was close to 4% in the 2000s, has slipped to around 1.4% since the global financial crisis. Recent estimates suggest potential growth fell as low as 0.7% in 2022 and even reached zero in 2023 (Janse van Rensburg & Morema, 2023). There is, however, some optimism: with the easing of load shedding, the Reserve Bank expects the growth impact to shrink to just 0.2 percentage points by 2025 (SARB, 2024). While the impact of load-shedding is easing, it remains a concern with periodic disruptions continuing to affect the system. Fixing the electricity system once and for all will be essential to rebuild confidence, a prerequisite for renewed investment and business dynamism (Demmou, 2025).

2.2 Household welfare and inequality

Electricity insecurity has increasingly drawn a line between households that can insulate themselves from outages and those that cannot. For higher-income families, backup solutions such as rooftop solar, inverters, or diesel generators have become routine investments that enable them to continue working from home, support their children's studies, and safeguard food security. Recent figures show that businesses and

wealthier households account for over 70% of newly installed rooftop solar capacity, while poorer families remain largely excluded from this shift (SSEG, 2018). In these households, daily life is repeatedly disrupted: families must rely on candles or paraffin stoves, face difficulties keeping perishable goods fresh, and lose valuable time to outages. What was once a shared national challenge has thus become an "energy divide," where reliable access to electricity is no longer universal but closely tied to income and wealth (Inglesi-Lotz, 2023).

This divide also plays out geographically. Larger urban municipalities, with stronger financial resources and technical capabilities, are beginning to procure renewable energy supplies and facilitate embedded generation. Smaller and more indebted municipalities, especially in rural and peri-urban areas, often struggle to maintain even basic infrastructure. Many municipalities spend barely 1% of infrastructure value on maintenance, compared to a national norm of 8% (Auditor-General South Africa, 2022), leaving residents vulnerable to extended outages. The result is that load-shedding not only lowers aggregate growth but also reshapes the distribution of opportunities across society. Over time, unequal access to reliable power risks reinforcing long-standing divides in education, employment, and health, leaving poorer households and communities increasingly disadvantaged while more affluent ones continue to adapt and progress.

2.3 Climate and competitiveness

The electricity sector is South Africa's largest emitter. With coal providing more than 80% of generation, the sector alone contributes 41% of greenhouse gas emissions. International comparisons show the economy is among the most carbon-intensive per unit of GDP suggesting that as growth accelerates, emissions could rise sharply (Kergozou, 2025). Moreover, as global trade partners roll out carbon border adjustment mechanisms, South Africa's reliance on coal may threaten competitiveness in export markets. Decarbonisation of South Africa's electricity sector has been limited so far. Recent emissions reductions stem primarily from lower consumption and supply disruptions. Despite increases in renewables, reaching a 9% share in 2021, available data suggests emissions intensity remains flat, unlike in China and India (Demmou, 2025). Furthermore, the draft IRP 2023 shifts focus from coal retirements to completing existing coal projects, projecting coal capacity to rise to 39.4 GW by 2030 (up from 33.4 GW in IRP 2019), reflecting persistent energy security concerns, and the trade-off in the short-term between energy security and green transition.

2.4 Short-term versus medium term challenges

Amid tight supply constraints, prioritizing energy security over decarbonization may be necessary in the short term. The draft 2023 Integrated Resource Plan, released in 2024, reflects this by proposing delays in some coal plant decommissioning. In the medium term, however, as plants reach the end of their life, expanding renewables could yield greater economic and social gains than investing in new coal capacity.

First, from a cost perspective, the average retail electricity tariff stood at USD 0.18 per kWh in 2022, while renewable energy procured under the Fifth Renewables Procurement Round was priced at roughly one-tenth of that level, confirming renewables' strong cost-competitiveness, though this comparison does not include grid costs (OECD, 2025). Estimates further show that the levelised cost of electricity from wind and solar is already lower than from new coal (Ember,2025; BloombergNEF, 2025). When accounting for health externalities, comparison with coal becomes even more cost-effective (OECD, 2023). Overall, the cost of non-transitioning could be very high (

Second, new coal projects will be increasingly difficult to finance, particularly through multilateral institutions under South Africa's Just Transition commitments. They also tend to face major cost overruns, such as at Medupi and Kusile (Tshidavhu & Khatleli, 2020), unlike renewables, which are cheaper, faster to deploy, and have demonstrated success under the REIPPP programme.

Third, renewables can foster inclusiveness by supporting universal electricity access. Despite progress, 14% of households remain without power, and the current 5–10% annual electrification rate is insufficient to meet the 2030 target (Meyer & Overen, 2021). Off-grid and small-scale renewable solutions, particularly solar home systems, offer cost-effective options for remote areas, especially in northern South Africa with its exceptional solar potential (Zubi et al., 2019).In short, electricity reform is not only about stabilising supply. It is the hinge for broader transformation—unlocking growth, reducing inequality, and aligning South Africa with global climate goals. While there is no silver bullet, accelerating the shift to renewable energy will be central to achieving these goals. Doing so will require a multipronged strategy, one that maximises the impact of existing renewable energy programmes, facilitates the integration of new capacity by addressing transmission constraints, clarifies the evolving role of municipalities in electricity procurement and distribution, and sets a pricing framework that balances affordability with the need to attract new investments.

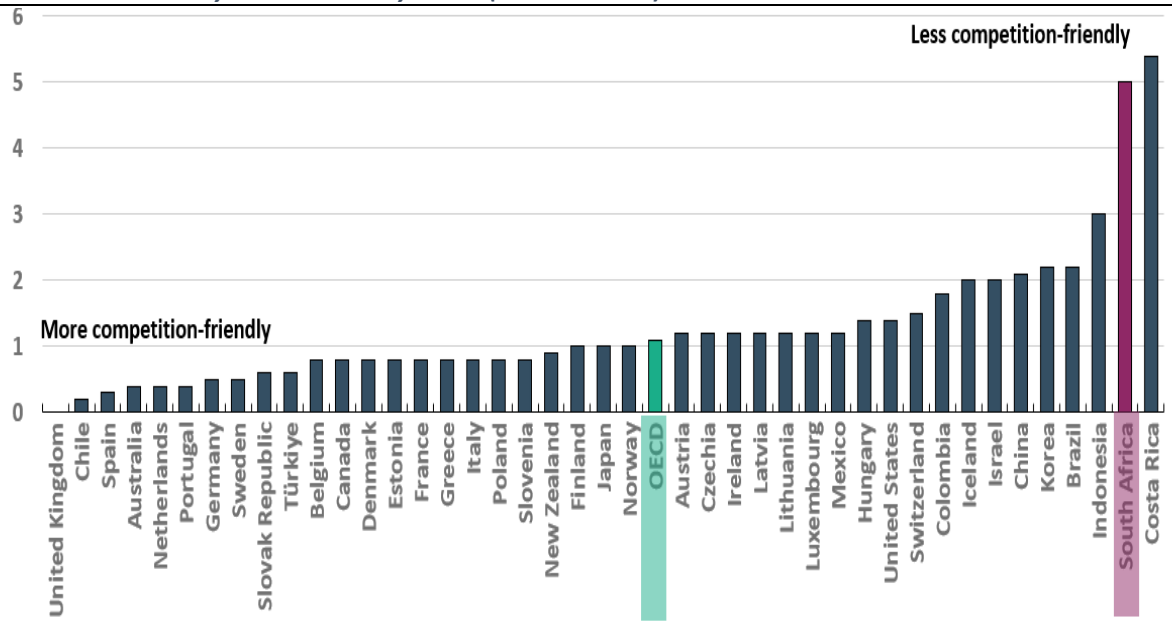
3. Policy recommendations

The previous sections demonstrated that the electricity reform in the country is characterized by urgency; the success of its implementation depends on overcoming deeply rooted structural constraints. Eskom's debt burden and overall fiscal pressures continue to be hurdles to large-scale public investment. At the same time, regulatory uncertainty and inefficient governance can slow the much-needed private sector participation. The local government and municipalities play a critical role in the distribution and local procurement of energy, but they face financial constraints and capacity challenges that hinder progress. Tariff reforms and job transitions are surrounded by social and political uncertainty, particularly in coal-dependent regions, which lack coordination and stakeholder engagement. All these constraints need to be acknowledged and considered to design feasible reforms.

3.1 Boosting independent power producers and small-scale generation

While the Renewable Energy Independent Power Producers Programme (REIPPP) has expanded renewable capacity and reduced wind and solar costs, its potential remains underutilized. The electricity market remains dominated by Eskom, with high entry barriers limiting the entry of new players to auction programmes and bilateral deals with municipalities or large corporates, which are still limited (**Error! Reference source not found.**).

Figure 1: Barriers to entry in the electricity sector (Index 2023-24)



Note: Barriers to entry in the electricity sector is one of the four components of the electricity indicator. The indicator for South Africa reflects the laws and regulations in force on 1 January 2023. For some countries, the indicator reflects those in force on 1 January 2024.
Source: OECD Product Market Regulation database and OECD-World Bank Group Product Market Regulation database for 2023/2024.

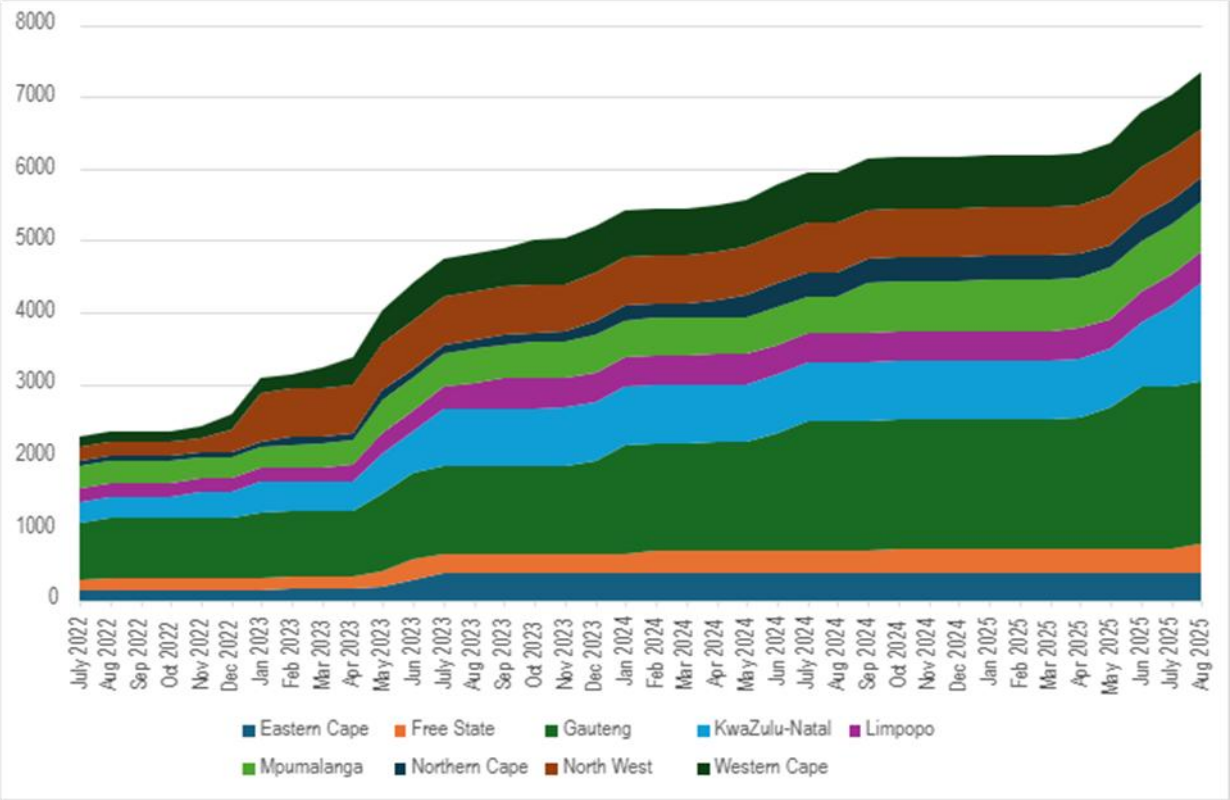
A fundamental restructuring of the electricity supply chain is now widely recognised as essential for sustained decarbonisation and long-term energy security. However, with a competitive wholesale market still absent, maximising the impact of REIPPP remains crucial during the transition. Delays in bid windows have created investor uncertainty and revenue gaps; shorter intervals would improve project continuity. Streamlining eligibility criteria and prioritising cost-efficiency could also further accelerate deployment.

Rooftop solar has helped improve energy resilience, growing fivefold from 1.2 GW in 2020 to 6.1 GW in 2024, supported in part by tax incentives under the Energy Action Plan. However, this support relies on upfront financing, which limits access for low-income households and financially constrained SMEs. International

models, like India's PM Surya Ghar scheme, offer more inclusive solutions through subsidies, concessional loans, and revenue-sharing from surplus electricity. Furthermore, enabling consumers to sell excess power can improve affordability and uptake. In South Africa, municipal credit schemes for surplus electricity often expire annually, discouraging participation. Cape Town's "Cash for Power" programme, launched in 2023, allows direct payments and full bill offsets. Scaling such models nationally could significantly expand small-scale generation.

The growth of rooftop solar is reflected in the provincial breakdown of maximum installed capacity between July 2022 and August 2025 (**Error! Reference source not found.**). National capacity has more than tripled during this period, increasing from around 2,200 MW to over 7,300 MW. Gauteng dominates the trend, reflecting its dense urban and industrial base, while KwaZulu-Natal and the Western Cape show particularly sharp increases from 2024 onwards. Other provinces contribute more modestly, with the Free State and Eastern Cape steadily expanding and the Northern Cape—despite being a hub for utility-scale projects—showing limited rooftop uptake. Overall, the data highlights both the rapid national momentum in distributed solar adoption and the uneven geography of growth, shaped by economic activity, urbanisation, and supportive local policies.

Figure 2: Maximum/Installed Rooftop PV (MW)



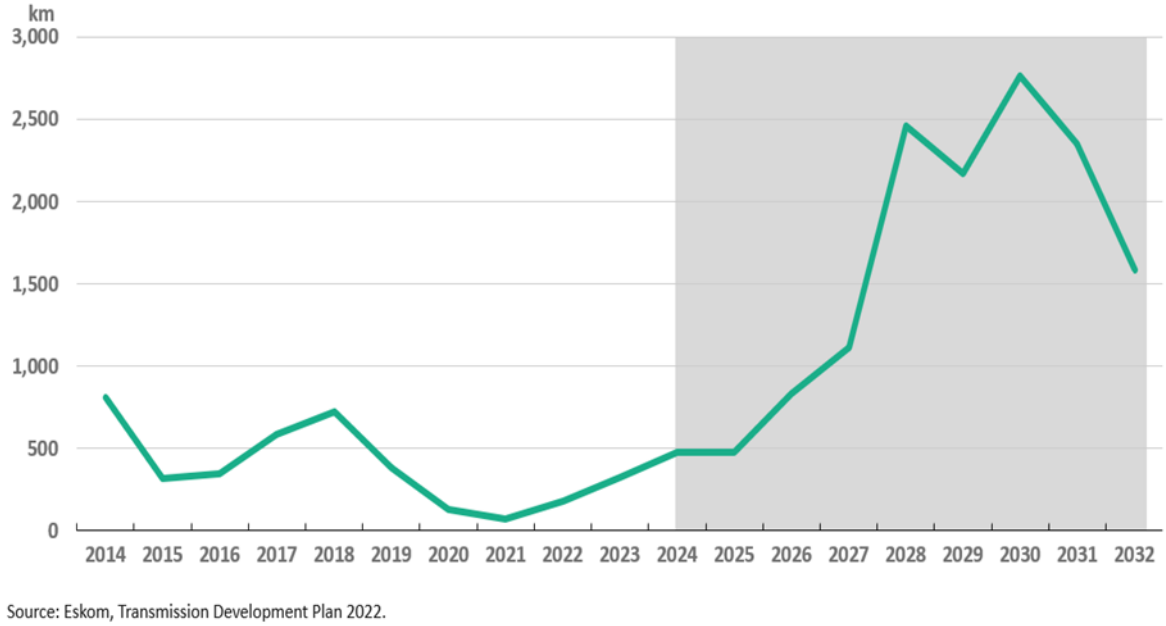
Source: NTCSA (2025, September)

3.2 Expanding Infrastructure

Expanding and modernising South Africa's transmission network is essential to accommodate variable renewable energy sources and ensure their reliable integration into the power system. Grid constraints have already delayed projects, as seen in the Sixth Renewables Procurement Round. Eskom's Transmission Development Plan targets 14,000 km of new lines by 2032 (half the current network) requiring a rapid scale-up from circa 500 km to over 2,000 km annually. Transmission projects currently take 8–10 years to complete, far longer than the 1–5 years for renewables generation projects, underscoring the need to streamline planning and align grid expansion with generation growth (see Figure 3).

Financing remains a central challenge for the Transmission Development Plan (TDP) 2022–2031 (Eskom, 2022). Eskom highlights that limited liquidity and capital constraints necessitate the reprioritisation of projects, with high-impact schemes pushed forward while lower-priority ones are deferred. The funding trajectory is closely tied to tariff determinations by NERSA and Eskom's broader corporate planning, meaning regulatory outcomes directly shape the pace and scale of transmission expansion. To address these pressures, Eskom acknowledges the need to leverage alternative financing mechanisms and external investment, while also mitigating risks associated with exchange rate fluctuations, commodity price volatility, and cost escalations. Delays in land acquisition, servitude approvals, and environmental authorisations further strain the funding environment, underlining the importance of flexibility in investment sequencing and project phasing. (Eskom, 2022)

Figure 3: Installation of new transmission lines and projected needs



Source: Eskom (2022)

Meeting the infrastructure goal requires closing a significant financing gap. Recent estimates suggest that of the approximately USD 21 billion needed, only about USD 4.7 billion in capital budget commitments has been secured for the 2025–2029 horizon (NTCSA, 2024; MyBroadBand, 2024; Bloomberg, 2024). The USD 21 billion figure is widely cited by commentators, although not yet confirmed in an official document. Against the backdrop of tight fiscal constraints, this gap highlights the importance of leveraging private investors. Independent power transmission (IPT) projects, increasingly adopted in emerging economies, could contribute to bridging the financing shortfall while requiring only limited institutional changes. The scheduled pilot IPT procurement process is thus a timely and positive development. Mobilising private finance requires reducing investor-perceived risks. While sovereign guarantees have supported REIPPP, fiscal constraints and high existing exposure limit their scalability to meet growing financing needs. However, without effective risk mitigation, IPT projects risk delays. As a partial solution, the National Treasury and NTCSA, with World Bank support, are developing a Credit Guarantee Vehicle to pool risk across multilateral development banks, private investors, and government. Complementary measures include securing investor payments through escrow accounts, streamlining permitting processes, and ensuring consistent, credible policy to enhance investor confidence.

3.3 Building Municipal Capacities

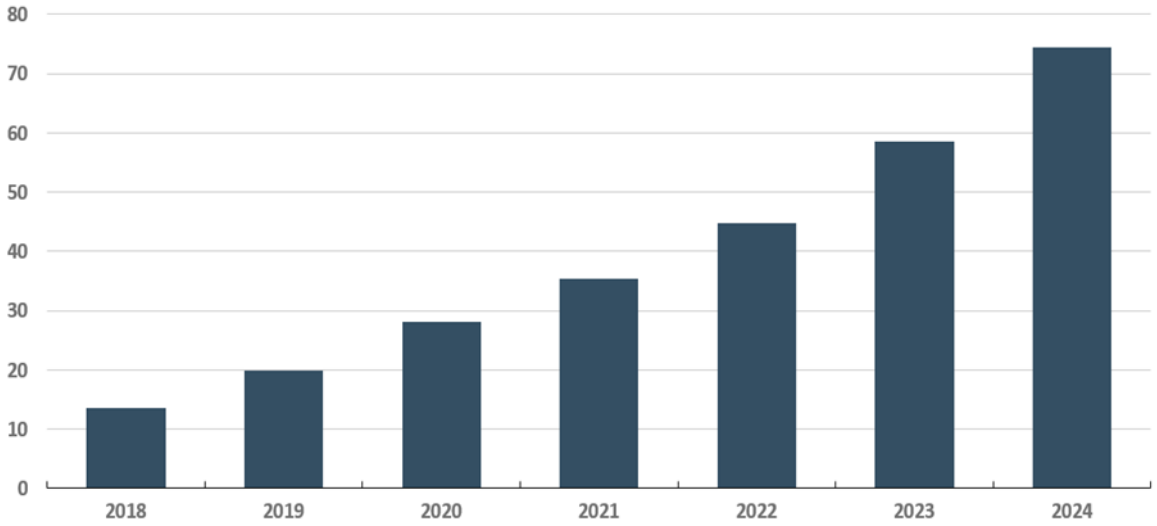
Municipalities occupy a central role in South Africa's electricity sector, directly distributing approximately 40% of power, as mandated by the Constitution, which assigns electricity distribution and supply to local government. Unlike in many countries, municipalities therefore assume direct operational responsibility rather than solely regulatory oversight. Revenue from electricity sales constitutes on average 25–30% of municipal income, reaching nearly 50% in some municipalities (Statistics South Africa, 2022). Under conditions of fiscal pressure and high debt, municipalities frequently divert electricity revenues to other functions, constraining investment in their own networks. Consequently, distribution infrastructure is often inadequately maintained, resulting in high losses, frequent outages, and increasing instances of theft and vandalism exacerbate the issue (Vanheukelom, 2023). The growth of renewable energy adds pressure on financially strained municipalities, as managing intermittent supply requires major investments in grid balancing, storage, and smart technologies.

Addressing the dependency to electricity revenue through a revision of the municipal funding model, particularly via the ongoing review of the Local Government Fiscal Framework, is essential. In parallel, targeted measures are required to address both financial constraints and managerial capacity gaps, thereby enhancing municipalities' ability to invest in network maintenance, upgrades, and expansion.

First, the cycle of debt (from households to Eskom and ultimately to the central government through bailouts) need to be broken, with municipalities representing the second critical node in this chain. Nearly half of municipalities, including major metros, face serious financial distress (Auditor General, 2022), limiting their ability to invest in network upgrades. Most municipal debt consists of arrears owed to Eskom, which reached ZAR 75 billion in February 2024, twice the 2021 level, and now accounts for 15% of Eskom's total debt, deepening its financial strain (Figure 4). Persistent non-payment of electricity bills exacerbates the problem: municipal financial performance declines by ZAR 291 for every ZAR 1 000 in bad debts written off (Murwirapachena, Kabange and Ifeacho, 2022).

A stronger payment culture is therefore essential. The National Treasury's SMART Meter project aims to improve revenue collection, but high installation costs and risks to low-income access remain. Addressing these requires new municipal funding sources and more effective support for indigent households, including reforming the Free Basic Electricity system (OECD, 2025). Better service delivery, accurate billing, and transparent cross-subsidisation are critical to restoring trust and value-for-money. Alternative funding, such as expanded property taxes, can also reduce reliance on electricity revenue. Regular valuation updates, simplified market-value systems (Franzsen, 2022), and digital or AI tools can improve tax collection efficiency, particularly in rural areas. Designing fair wheeling tariffs is also vital: as self-generation grows, fixed charges can ensure municipalities recover distribution costs despite falling electricity sales.

Figure 4: Amount of arrears payments to the state-utility electricity company Eskom (ZAR billion)



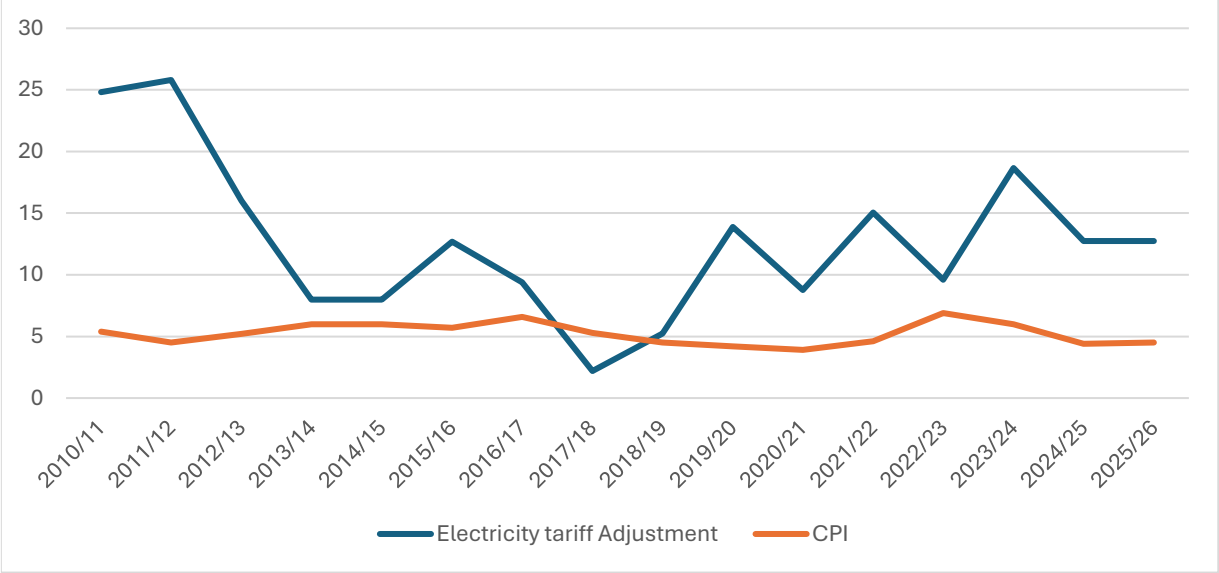
Source: Eskom (2024)

A second important challenge is capacity building. Despite ZAR 40 billion spent on capacity building over 2016–2021, significant gaps remain. Strengthening municipal capacity should be a top policy priority, which is aligned with the Phase II of Operation Vulundlela. However, this may take times to deliver. In parallel, partnerships with stronger municipalities or shifting responsibilities to provinces could help address capacity gaps and reduce fragmentation. For instance, revisiting regional energy distributors (REDs) could enhance investment and governance—though it would require constitutional change—and improve both Eskom-supplied service delivery and the municipalities' role in contracting renewable energy. An alternative approach in the medium term is concessioning electricity distribution in struggling municipalities to private operators. This could improve service delivery and attract investment, as demonstrated in Portugal. Under this model, municipalities retain grid ownership and receive concession fees, with clear obligations for access, quality, and affordability. However, resistance is likely, as electricity sales account for 25–30% of municipal revenue—and up to 50% in some cases. In South Africa, this approach may face significant obstacles. Underinvestment, theft, maintenance backlogs, widespread non-payment, and likely resistance from municipalities that depend on electricity revenues all undermine the financial viability of such concessions and may deter private investors. Restoring confidence through stronger governance and enforcement is therefore a necessary first step.

3.4 Establishing the right pricing framework

Electricity tariffs have risen nearly tenfold since 2000, far outpacing inflation. Yet Eskom remains financially fragile, having required repeated government bailouts. South Africa now faces a triple challenge: ensuring cost recovery, keeping electricity affordable, and sending the right signals for the green transition. **Error! Reference source not found.** illustrates the widening gap between electricity tariff adjustments and consumer price inflation (CPI) over the past decade. Annual tariff increases consistently exceed general inflation, with notable spikes such as 24.8% in 2010/11 and 18.7% in 2023/24 compared to CPI rates of around 5–7%. Even in years with smaller increases, tariffs still outpace inflation, culminating in compounded growth that makes electricity costs rise far faster than the overall price level in the economy. This divergence underscores how electricity has become relatively more expensive for households and firms, eroding affordability and competitiveness while reflecting Eskom's effort to recover costs amid financial strain.

Figure 5: Electricity tariff adjustment and CPI (in %)



Source: Eskom (2025)

The cost-recovery dilemma

South Africa's electricity pricing has long struggled with the cost-recovery dilemma. Tariffs were historically kept below sustainable levels, but Eskom's financial crisis, mismanagement, and falling sales in the 2010s and 2020s forced steep price hikes. Yet these increases came without improved reliability, eroding public trust and pushing households and businesses toward self-generation, weakening the utility's revenue base even further.

A modern tariff framework must balance cost recovery with affordability, environmental goals, and decentralisation. Transparent, segmented tariffs can clarify costs across consumer groups, while revenue-cap models encourage efficiency. Expanding net metering and net selling would reward small-scale producers, and scaling up carbon pricing—paired with targeted subsidies—can accelerate the shift to renewables while protecting vulnerable households. By embedding accountability, a culture of payment, and incentives for green and decentralised generation, tariff reform can secure financial sustainability and inclusiveness, positioning electricity as an engine of the green transition rather than a driver of inequality.

4. Conclusion

South Africa's electricity sector remains at the centre of both the country's economic struggles and its hopes for renewal. The analysis shows that persistent outages have not only slowed growth and undermined competitiveness but have also altered the daily lives of households and communities. Electricity cuts mean missed work hours, lost schooling opportunities, and higher living costs. At the same time, the unequal ability to invest in alternatives has deepened divides between those who can shield themselves from load shedding and those who cannot. At the same time, the sector's overwhelming reliance on coal makes it the single largest obstacle to meeting climate targets and sustaining access to export markets. Electricity is thus more than a technical bottleneck: it is the thread connecting South Africa's growth, social cohesion, and global standing.

Breaking this cycle requires bold but pragmatic reforms. Expanding independent and small-scale generation can bring much-needed diversity, resilience, and competition to the market, provided financing solutions are accessible to small firms and wealthy households. Investments in transmission and distribution infrastructure must accelerate to unlock renewable energy potential, but this will require creative financing models and greater private-sector participation. Municipal reform is equally essential: without stronger local capacities and fairer funding arrangements, inequalities in service delivery will persist, leaving millions of citizens behind.

Lastly, getting pricing right is unavoidable. Electricity tariffs must recover costs to ensure financial sustainability, yet reforms must go further by building trust through transparency, rewarding efficiency, and safeguarding affordability. A modern pricing framework should enable households and small businesses to participate in the green transition—through mechanisms like net selling and targeted subsidies—while stabilising Eskom's finances and guiding the economy towards lower-carbon growth. With such a framework, electricity can shift from being a daily source of frustration and inequality to becoming a driver of opportunity, innovation, and resilience in South Africa's just energy transition.

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