South Africa’s severe electricity problems

Credit: Researched, Written and compiled by Tony Stone

Eskom has received over R496 billion in government bailouts since 2008, with R242 billion before 2023. The utility carries R337 billion in government-guaranteed debt, risking taxpayer liability if it defaults. Widespread non-payment by citizens, businesses, and municipalities has led to over R110 billion in municipal debt to Eskom. Non-payment stems from poverty, poor service, illegal connections, and political protests, weakening Eskom’s revenue. Eskom’s history of corruption, procurement fraud, sabotage, and poor maintenance has caused infrastructure decay and operational issues. State capture drained resources, leading to unreliable power stations and reliance on bailouts to stay afloat. Illegal connections and meter tampering overload local substations, reducing revenue and causing outages. Solutions include direct revenue collection, smart prepaid meters, and tariff restructuring for affordability. An urgent need for private investment, streamlined approvals, and fast-track projects to build 14,000 km of high-voltage lines. Eskom needs to accelerate private transmission projects and classify grid expansion as strategic infrastructure.

Eskom is South Africa’s state-owned national electricity public utility. Established in 1923, it is the largest producer of electricity on the African continent, generating roughly 90% of South Africa's power. The utility handles the generation, transmission, and distribution of electricity to municipalities, businesses, and households across the country. Eskom has five major problems.

1. the culture of non-payment and municipal debt;
2. legacy corruption, state capture and governance failure;
3. an ageing and historically unreliable generation fleet;
4. inadequate transmission capacity;
5. an electricity-market and municipal-distribution model that is no longer financially sustainable.

The culture of non-payment

The culture of non-payment in South Africa refers to the widespread, systemic practice where individual citizens, businesses, and local government municipalities deliberately do not pay for utilities like electricity and water. This phenomenon has created a massive financial crisis, leaving local authorities severely indebted to bulk utility suppliers like Eskom.

The culture originated as a highly coordinated tool of political protest during the anti-apartheid struggle. Black townships engaged in mass boycotts of rent, rates, and service fees to financially starve illegitimate local authorities. What began as a noble act of political resistance transformed over decades into an entrenched, peacetime social norm. And the ANC have done nothing about it.

However, as a qualifier, given the high levels of unemployment and the small amounts of disposable cash available to pensioners, many simply cannot afford to pay for electricity above the qualifying indigent households free electricity levels of between 50 kWh and 120 kWh per month, depending on their municipality.

Many citizens believe basic services should be entirely free, often citing distorted interpretations of post-apartheid political campaign promises. High national unemployment rates make it economically impossible for millions of impoverished households to pay rising utility tariffs. Communities frequently withhold payment as a form of protest against poor service provision, structural neglect, and corrupt municipal workers. Widespread electricity theft via bypassing meters overloads local grid infrastructure and starves the utility of revenue.

Inefficient local administrations regularly issue highly inaccurate, inflated, or late utility bills. Paying customers frequently refuse to pay when bills are clearly faulty, driving general non-compliance. Corrupt or poorly managed municipalities collect electricity payments from paying residents but fail to pass those funds up to Eskom. Government departments, public schools, and even state hospitals have historically adopted this non-payment habit.

Because of the culture of non-payment, the total municipal debt to Eskom skyrocketed past R110 billion, severely draining the utility's immediate operating cash flow. The National Treasury has begun strictly withholding critical infrastructure funds from dozens of defaulting local councils to enforce compliance. The state's National Treasury Municipal Debt Relief Programme offers conditional write-offs, but participating municipalities must still strictly maintain current monthly payments. Despite debt relief incentives, participating municipalities quickly racked up over R47 billion in new, post-relief arrears.

Mismanagement and corruption

Since 1994, Eskom's systemic mismanagement and corruption have historically crippled the utility, leading to an unsustainable debt burden nearing a half a trillion-rand, infrastructure decay, and years of rotational power outages. The utility is battling the legacy of state capture, which has severely drained its operational and financial capacity. Key factors contributing to the crisis include:

- **Procurement fraud:** Syndicates and corrupt officials have historically inflated prices for basic goods and materials—such as paying drastically marked-up prices for items like knee pads and mops—costing the utility billions in lost revenue. This also includes Eskom paying premium prices and making irregular prepayments for coal that is out of specification and unsuited for its boilers.
- **Syndicated sabotage:** Criminal networks and colluding contractors have deliberately damaged power station infrastructure to trigger breakdowns, ensuring they could secure lucrative, inflated repair contracts.
- **Operational mismanagement:** Delayed maintenance and poor planning have historically resulted in critically low generation capacity.
- **Municipal debt:** Widespread non-payment by local municipalities continues to severely impact Eskom's cash flow, forcing the utility to rely on government bailouts.

In response to the corruption and operational decline, the South African government has stepped up recovery and restructuring efforts. Law enforcement and oversight bodies—including the Special Investigating Unit (SIU)—have been actively freezing illicitly acquired assets and pursuing individuals involved in multibillion-rand procurement scams.

Furthermore, the state has unbundled Eskom into three distinct divisions (Generation, Transmission, and Distribution) to introduce market competition and open the grid to independent power producers. This ongoing structural reform is intended to decentralize the power sector, attract private investment, and relieve the utility of its sole monopoly

Financial bailouts

The South African government has paid Eskom approximately R496 billion in total taxpayer bailouts. According to data provided by the National Treasury, this staggering amount spans all financial allocations distributed to the power utility since the 2008/09 financial year. The total fiscal support is structured across two major waves of intervention.

Over a 14-year period, between 2008 and 2022, the state consistently injected hundreds of billions of rands into Eskom to keep it from defaulting on its debt obligations and to fund capital expansion projects like the Medupi and Kusile power stations. The baseline, pre-2023, and prior to the major structural debt intervention, the utility had already consumed nearly R242 billion in direct state bailouts.

Then, in February 2023, the government announced a massive, formalized R254 billion debt relief package designed to take over more than half of the utility's debt. However, this strategy was subsequently adjusted by Parliament and the National Treasury via the *Eskom Debt Relief Amendment Act*:

Due to specific operational changes and Eskom missing certain targets (such as failing to dispose of the Eskom Finance Company on time), the five-year total projection for this specific package was downscaled to R230 billion.

By March 2025, the government had advanced R140 billion of this specific relief package directly to Eskom.

To insulate Eskom from escalating municipal arrears, the final phases were modified to increase the utility's direct Treasury allocation to R80.2 billion for the 2025/2026 financial period, with an added future safety net of R10 billion scheduled for the 2028/2029 financial year.

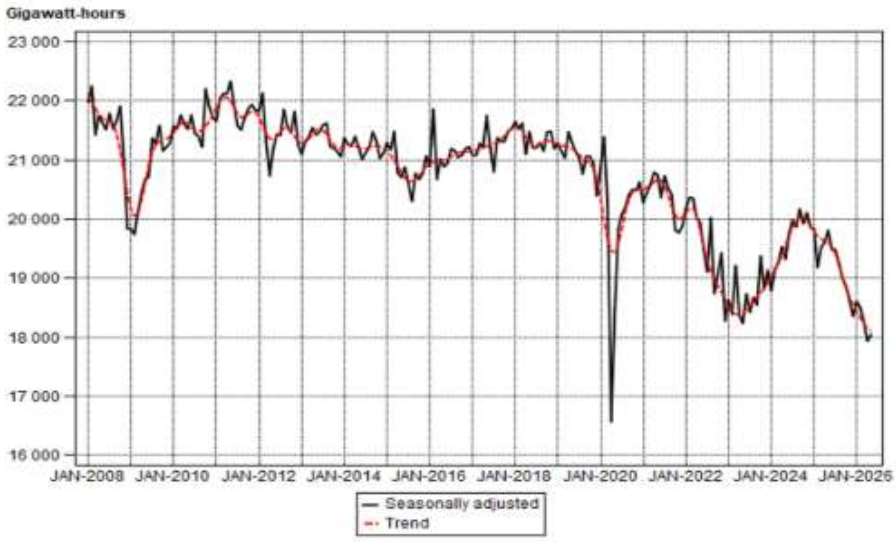
While direct cash injections hover near the half-a-trillion mark, the actual liability borne by South African taxpayers is significantly higher. The state still holds R337 billion in government-guaranteed debt for Eskom. If the utility fails to meet its remaining private obligations, the state is legally bound to step in and absorb those costs directly.

Eskom’s operations

Eskom's operations heavily rely on a fleet of coal-fired power stations, though it also operates nuclear, gas, and renewable energy facilities. Historically the cornerstone of the South African economy, Eskom has struggled in recent decades with maintenance backlogs, capacity constraints, and debt, which has led to rolling blackouts (locally known as "load-shedding").

Eskom operates a diverse fleet of 27 power stations across South Africa's provinces, generating an official total nominal capacity of approximately 54,460 MW at maximum capacity.

Electricity generated in South Africa
(January 2008 – May 2026)



The fleet's operational health varies dramatically based on age: the older coal fleet (averaging 40–50 years old) suffers from frequent breakdowns and high maintenance needs, while newer tier-1 stations (Medupi, Kusile) and peaking/nuclear stations have seen an intense Generation Recovery Plan focus to stabilize their state of repair.

The complete breakdown of Eskom's power stations by province, type, maximum capacity, age, and repair status is detailed below.

Mpumalanga Province (12 Stations)

Mpumalanga is the heart of South Africa's electricity production, housing the vast majority of Eskom's coal base-load fleet.

Arnot Power Station • **Type:** Coal • **Max Capacity:** 2,352 MW • **Age State:** Old (Commissioned 1971–1975). Scheduled for decommissioning between 2025–2029. • **Repair State:** Fair to poor. Plagued by coal quality issues and aging components; undergoing short-term life-extension maintenance.	**Camden Power Station** • **Type:** Coal • **Max Capacity:** 1,561 MW • **Age State:** Very Old (Commissioned 1967; mothballed in 1990 and recommissioned in 2005). Past its original lifespan. • **Repair State:** Poor. Experiencing high unplanned breakdowns (UCLF); scheduled for staggered shutdown.
Duvha Power Station • **Type:** Coal • **Max Capacity:** 3,600 MW • **Age State:** Old (Commissioned 1980–1984). • **Repair State:** Poor. Unit 3 has been offline long-term due to historic structural damage, dragging down overall station performance.	**Grootvlei Power Station** • **Type:** Coal • **Max Capacity:** 1,180 MW • **Age State:** Very Old (Commissioned 1969; recommissioned 2008). • **Repair State:** Fair. Mostly utilized for grid support; being prepared for Just Energy Transition (JET) repurposing.
Hendrina Power Station • **Type:** Coal • **Max Capacity:** 1,893 MW • **Age State:** Very Old (Commissioned 1970–1976). Near end of operational life. • **Repair State:** Critically poor. Multiple units have already been shut down due to age-related degeneration.	**Kendal Power Station** • **Type:** Coal (Dry-cooled) • **Max Capacity:** 4,116 MW • **Age State:** Mid-aged (Commissioned 1988–1992). • **Repair State:** Fair. Experiencing strict environmental compliance overhauls for high emissions alongside ongoing maintenance.
Komati Power Station • **Type:** Coal / Solar-Battery hybrid pilot • **Max Capacity:** 1,000 MW (Coal historically)	**Kriel Power Station** • **Type:** Coal • **Max Capacity:** 3,000 MW • **Age State:** Old (Commissioned 1976–1979).

• **Age State:** Decommissioned (Coal units shut down in 2022). • **Repair State:** Transformed. Currently the active pilot site for Eskom's renewable repurposing project.	• **Repair State:** Poor. High vulnerability to boiler tube leaks; subject to aggressive intermediate repairs.
Kusile Power Station. • **Type:** Coal (Supercritical) • **Max Capacity:** 4,800 MW (full design) • **Age State:** New (Commissioning finalized between 2021–2025). • **Repair State:** Good. Recovering strongly after a major chimney flue duct collapse in 2022; all units are progressively stabilizing back into the grid.	**Majuba Power Station** • **Type:** Coal • **Max Capacity:** 4,110 MW • **Age State:** Mid-aged (Commissioned 1996–2001). • **Repair State:** Fair. Experiencing improved reliability after a major coal silo collapse recovery year's back.
Matla Power Station 1. **Type:** Coal 2. **Max Capacity:** 3,600 MW 3. **Age State:** Old (Commissioned 1979–1983). 4. **Repair State:** Fair to poor. Undergoing continuous refurbishment of its aging plant apparatus.	**Tutuka Power Station** • **Type:** Coal • **Max Capacity:** 3,654 MW • **Age State:** Old (Commissioned 1985–1990). • **Repair State:** Historically poor. Historically the worst-performing station due to maintenance neglect and internal disruptions, but currently receiving priority maintenance interventions.

Limpopo Province (2 Stations)

Limpopo holds Eskom's massive baseload dry-cooled giants, heavily relying on the nearby Waterberg coalfields.

Matimba Power Station • **Type:** Coal (Dry-cooled) • **Max Capacity:** 3,990 MW • **Age State:** Mid-aged (Commissioned 1987–1991). • **Repair State:** Good. Consistently one of Eskom's most reliable and best-performing coal stations.	**Medupi Power Station** • **Type:** Coal (Supercritical) • **Max Capacity:** 4,764 MW • **Age State:** New (Fully commissioned in 2021). • **Repair State:** Good (Tier 1). Operating at high performance, though Unit 4 has undergone extensive rebuilds following a post-commissioning hydrogen explosion.

Western Cape & West Coast (5 Stations)

The Western Cape features a mix of nuclear base-load generation and quick-reaction peaking stations.

Koeberg Power Station • **Type:** Nuclear • **Max Capacity:** 1,934 MW • **Age State:** Mid-aged (Commissioned 1984–1985). Recently approved for a 20-year operational life extension. • **Repair State:** Good. Has undergone massive, scheduled unit outages for steam generator replacements to guarantee safety compliance.	**Ankerlig Power Station** • **Type:** Open Cycle Gas Turbine (OCGT) • **Max Capacity:** 1,338 MW • **Age State:** Modern (Commissioned 2007). • **Repair State:** Excellent. Well-maintained peaking plant, though costly to run due to heavy diesel fuel consumption.
Gourikwa Power Station • **Type:** Open Cycle Gas Turbine (OCGT) • **Max Capacity:** 746 MW • **Age State:** Modern (Commissioned 2007). • **Repair State:** Excellent. Operational for peak demand and grid stability.	**Palmiet Power Station** • **Type:** Hydro Pumped Storage • **Max Capacity:** 400 MW • **Age State:** Mature (Commissioned 1988). • **Repair State:** Good. Co-managed with the Department of Water and Sanitation; highly functional.

Sere Power Station • **Type:** Wind Energy • **Max Capacity:** 100 MW • **Age State:** New (Commissioned 2015). • **Repair State:** Excellent. Low maintenance required; performing optimally within weather constraints.	***Note**: **Acacia Power Station** (a 171 MW Gas Turbine) acts as local standby grid backup for Koeberg's safety systems.*

KwaZulu-Natal & Free State Border (3 Stations)

These focus primarily on hydro-pumped storage schemes to balance peak daily electricity demands.

Ingula (KZN/Free State border) • **Type:** Hydro Pumped Storage • **Max Capacity:** 1,332 MW • **Age State:** New (Commissioned 2016–2017). • **Repair State:** Excellent. Operates cleanly to buffer peak morning and evening surges.	**Drakensberg** (KZN/Free State border) • **Type:** Hydro Pumped Storage • **Max Capacity:** 1,000 MW • **Age State:** Mature (Commissioned 1981). • **Repair State:** Good. Highly reliable mechanical state.
Lethabo (Free State) • **Type:** Coal • **Max Capacity:** 3,708 MW • **Age State:** Mature (Commissioned 1985–1990). • **Repair State:** Good. Uniquely designed to burn low-grade, high-ash coal; consistently stands as one of the fleet's top performers due to stable local supply.	

Eastern Cape, Free State & Northern Cape (4 Stations)

These locations utilize standard hydroelectric generation along the Orange and Kei river systems.

Gariep Power Station (Free State/Eastern Cape border) • **Type:** Hydroelectric • **Max Capacity:** 360 MW • **Age State:** Old (Commissioned 1971). • **Repair State:** Good. Dependent entirely on dam water levels.	**Vanderkloof Power Station** (Free State/Northern Cape border) • **Type:** Hydroelectric • **Max Capacity:** 240 MW • **Age State:** Old (Commissioned 1977). • **Repair State:** Good. Structurally sound.
Port Rex Power Station (Eastern Cape) • **Type:** Open Cycle Gas Turbine (OCGT) • **Max Capacity:** 171 MW • **Age State:** Old (Commissioned 1976). • **Repair State:** Fair. Primarily used as a rapid response backup for the Eastern Cape grid.	**Small Hydro Stations** (Eastern Cape) • **Stations:** *Colleywobbles/Mbashe* (42 MW), *First Falls* (6 MW), *Second Falls* (11 MW). • **Type:** Run-of-river mini-hydro. • **State:** Operational but highly dependent on seasonal river flows.

Summary Table: Provincial Fleet Breakdown

Province	Station Count	Dominant Type	Combined Max Capacity	General Fleet State
Mpumalanga	12	Coal	~34,300 MW	Critical to Fair (Suffers heavily from age)
Limpopo	2	Coal	~8,790 MW	Good (Newer "Tier 1" infrastructure)
Free State	2	Coal	~3,708 MW	Good (Highly consistent performer)
Western Cape	6	Nuclear/Gas/Wind	~4,500 MW	Excellent to Good (Well-maintained peaking fleet)
KZN / Drakensberg Borders	3	Pumped Storage	~2,332 MW	Excellent (Modern grid balancing)

EC & NC Borders	2	Hydro/Gas Peaking	~830 MW	Fair to Good (Water/fuel resource dependent)
			54,460 MW	

South Africa's national electricity grid has experienced a sustained period of improved supply and generation stability, enabling a record-long reprieve from nationwide rolling blackouts (load shedding). This stability is driven by better performance at state-owned utility Eskom's coal plants and a massive surge in private, behind-the-meter solar installations.

While generation shortages have been heavily mitigated, the electricity supply sector remains fragile and faces critical, ongoing challenges. However, they have achieved a positive turnaround in their last financial year. The utility posted a full-year after-tax profit of R16 billion in FY2025 (its first in eight years). This positive momentum continued with an interim after-tax profit of R24.3 billion in the first half of FY2026. The utility's turnaround is driven by the following key performance gains:

Profitability Turnaround

Eskom reported an after-tax profit of R16 billion for FY2025, rebounding from a R25.5 billion loss the previous year. EBITDA rose significantly to R68.5 billion in the first half of FY2026. A massive reduction in the reliance on expensive open-cycle gas turbines (OCGTs) saved the utility over R16.3 billion in primary energy costs. Standard & Poor's upgraded Eskom's credit rating for the first time in almost two decades, citing improved fiscal risks and stability.

EAF (Energy Availability Factor)

The average year-to-date EAF has climbed past the 65% mark, notably reaching 65.31% over the financial year. The generation fleet now frequently achieves or exceeds the 70% EAF daily threshold. Reduced plant breakdowns by over 5,500 MW, cutting the reliance on emergency diesel reserves.

Load shedding

Load shedding is a national measure used when electricity demand exceeds total supply, requiring Eskom to turn off power in stages across the country to prevent a total grid collapse. Load reduction, by contrast, is a localized measure implemented in specific neighbourhoods where the national grid has enough power, but overloaded local transformers or mini-substations risk failing or exploding due to sabotage, vandalism, copper cable theft, illegal connections,, or high peak-time demand. Load shedding follows strict, predictable stages. Load reduction often happens suddenly during peak hours (5:00 AM to 9:00 AM and 5:00 PM to 10:00 PM). Eskom has recorded over 400 consecutive days without national load shedding, successfully maintaining a stable power grid. This turnaround is due to sustained improvements in the Energy Availability Factor (EAF) and reduced reliance on diesel. However, certain local areas may still occasionally experience load reduction to protect transformers from overloading. However, significant reduction in electricity demand and Eskom's EAF generation improvements allowed Eskom to eliminate nationwide load shedding.

Localized "Load Reduction"

While nationwide load shedding has been suspended, local power cuts (termed load reduction) still occur in certain areas. This is typically implemented by Eskom to prevent grid overloading caused by illegal connections, meter tampering, or localized equipment failure, particularly during peak winter hours.

Load reduction is currently restricted to just three of South Africa's nine provinces, following aggressive implementation of Eskom's nationwide Load Reduction Eradication Programme. As of July 2026, roughly 1.19 million customers have been completely removed from these localized outage schedules. This represents about 70% of Eskom's total eradication target, with the utility aiming for total nationwide elimination of load reduction by March 2027. So far load reduction has been successfully eliminated in six provinces (Western Cape, Northern Cape, Free State, Mpumalanga, North West, and Limpopo). The remaining scheduled outages are concentrated primarily in Gauteng, followed by KwaZulu-Natal and the Eastern Cape. Where it is still required, Eskom enforces load reduction twice daily during high-demand peak hours: in the morning from 05:00 to 09:00 and in the evening from 17:00 to 22:00. In Gauteng, outages target specific geographical clusters (grouped into Blocks A through J). High-density communities around Soweto, Ekurhuleni, Tshwane, the Vaal, and the West Rand are frequently affected.

Unlike load shedding, which happens when power stations cannot generate enough electricity for the whole country, load reduction is a localized network defence mechanism. Eskom purposefully shuts off specific areas for the following reasons:

High-density neighbourhoods often draw more electrical current than local infrastructure is designed to support. When demand surges during cold winter mornings and evenings, the grid risks catastrophic failure.

According to the Ministry of Electricity and Energy, the primary driver in townships and informal settlements is a high volume of unauthorized grid connections. This unmetered usage overburdens local lines.

If Eskom does not cut the power proactively, the extreme overload will cause multi-mini substations and local transformers to overheat, catch fire, or explode. Replacing a blown transformer can take days or weeks, so load reduction is used to prevent extended, unplanned blackouts.

Eskom is currently clearing the remaining provinces by upgrading local electrical infrastructure, removing illegal connections, and aggressively rolling out smart meters to monitor real-time household consumption and tampering.

Transmission Bottlenecks:

A lack of sufficient grid infrastructure severely limits the ability to wheel and transmit new renewable energy projects, hindering broader long-term energy security.

Transmission bottlenecks have replaced power generation shortages as South Africa's primary energy crisis, locking out 53 gigawatts (GW) of potential new generation capacity. Fully funded and shovel-ready wind and solar projects remain completely stranded or restricted because the physical grid cannot absorb their electricity.

The state needs to build 14 000 kilometres of new high-voltage transmission lines and 170 transformers over the next decade. However, development is drastically behind schedule—South Africa requires roughly 1 400 km of new lines annually but has recently managed just 80 km per year, which would take 175 years to complete the 14,000 kilometres. The extreme deficit in grid capacity stems from a combination of geographical, legacy, and financial factor.

South Africa's grid was historically built around the massive coal-fired power stations in Mpumalanga to supply cities and industries. Conversely, the country's best solar and wind resources are located thousands of kilometres away in the Northern Cape, Western Cape, and Eastern Cape. The lines running out of these high-resource coastal provinces are now completely saturated.

Over the last twenty years, state-owned utility Eskom focused its capital on building delayed mega-coal projects (Medupi and Kusile) and managing massive debts. Funding was aggressively diverted away from maintaining and expanding the transmission network.

Building a private solar farm takes less than two years, whereas constructing heavy high-voltage grid infrastructure takes seven to ten years. The private sector's appetite to generate green energy has drastically outpaced the state's ability to wire it.

Progress is slowed down by extensive regulatory red tape, lengthy environmental impact assessments, severe shortages of specialized technical engineering skills, and protracted negotiations to secure land access (servitudes) across private properties.

The operational consequences are harsh. The National Transmission Company South Africa (NTCSA) frequently orders operating wind and solar farms to intentionally reduce or shut off their power generation because the lines are overloaded. This has triggered nearly R2 billion in compensation claims against the state for wasted green energy.

Private companies and large independent power producers (IPPs) are struggling to secure financial backing for new energy projects because they cannot guarantee a grid connection. This threatens long-term energy security once aging coal plants eventually retire.

To resolve the bottleneck, the Ministry of Electricity and Energy has unbundled Eskom's transmission division into the independent NTCSA.

Because the state fiscus cannot afford the estimated R440 billion needed for grid expansion, the government has launched the Independent Transmission Projects (ITP) Programme. This framework models private sector funding and construction for the transmission sector, mimicking the successful private bidding system used for renewable energy generation. Significant acceleration of the physical line build-out is expected to commence from the 2027 financial year

Municipal debt and affordability

Deep-seated financial challenges persist at the municipal level, with many local governments struggling to pay their bulk accounts to Eskom. Furthermore, consumers are battling rising electricity costs, as tariffs have exponentially increased over the last decade

The municipal debt crisis has reached an unprecedented scale, with local councils now owing Eskom a staggering R110.5 billion. This surging non-payment by municipalities severely threatens the financial stability of the entire national electricity sector, while consumers face a compounding affordability crisis as electricity tariffs consistently rise far above regular inflation.

The intersection of unpaid municipal debt and dwindling consumer affordability has created a critical structural economic risk.

The vast majority of the R110.5 billion debt belongs to chronic defaulting councils. Nearly half of the total is owed by just four municipalities: Matjhabeng (Free State), Emfuleni (Gauteng), Emalahleni (Mpumalanga), and the City of Johannesburg (Gauteng).

The crisis has become so severe that National Treasury has implemented a funding freeze on 69 non-compliant municipalities, blocking their equitable share allocations as a last resort to force debt repayment.

The National Energy Regulator of South Africa (NERSA) approved a further 8.76% hike for Eskom direct customers and a 9.01% average hike for municipal consumers. This follows years of double-digit compound increases that have priced millions of low-income households out of the energy market.

The vicious cycle of rising debt and failing affordability is driven by institutional breakdown, infrastructure decay, and changing energy dynamics. In order to offset the shortfall in revenue due to spiralling debt, Eskom, through NERSA, put through massive tariff hikes, which residents can't afford so many just don't pay, engage in electricity theft through illegal connections or go with independent solar power. This collapses municipal revenue which leads to municipalities defaulting on their R110.5bn Eskom debt.

Historically, local municipalities relied heavily on marking up electricity sales to businesses and residents to fund other basic services, like sewage and road maintenance. However, as tariffs skyrocket, wealthier households and industrial companies are migrating away from the grid onto private solar systems. This leaves municipalities with a shrinking pool of paying customers, crippling their primary revenue source.

According to reports from the Bureau for Economic Research (BER), municipalities are technically billing residents but fail to actually collect the money. Consumers and businesses owed local governments over R234.7 billion in outstanding debt. Bad administration, broken billing systems, and political reluctance to cut off non-paying areas stop councils from recovering cash.

In many municipal distribution areas, up to 30% of the purchased electricity is lost before it can be billed. This is due to massive technical distribution losses from unmaintained, aging municipal grids, combined with widespread illegal connections, meter tampering, and electricity theft. Municipalities must still pay Eskom for this "lost" bulk power despite getting zero income from it.

Ordinary South Africans are facing flatlined wage growth alongside simultaneous price hikes across multiple municipal utilities. Water tariffs (up to 12% in some metros), refuse removal, and property rates have all surged alongside electricity, forcing poor households to look for illegal grid connections or revert to unsafe energy sources.

To halt the collapse, the government is moving away from basic bailouts toward strict intervention. More than 60 municipalities failed to meet the conditions of the national Municipal Debt Relief Programme and are facing strict penalties. Eskom is actively rolling out Distribution Agency Agreements—effectively stepping in to take control of billing, revenue collection, and smart prepaid meter installations directly from failing local councils

Problems and implications

When all these structural, financial, and geographical factors collide, state utility Eskom finds itself trapped in a complex crisis. The core issues it faces—and the cascading implications they have for Eskom's survival and South Africa's economy—can be broken down into three major pillars.

1. **The structural financial death spiral**

   1.1 The Problems:

   Despite Eskom's R110.5 billion municipal black hole, that is growing, Eskom is legally obligated to continue supplying bulk electricity to local councils, even when those councils continuously default on their payments.

   Fed up with years of Eskom mismanagement, state capture, corruption, the culture of non-payment and load shedding, and as grid tariffs skyrocket, has forced Eskom's most reliable, high-paying customers (heavy industries, mines, and wealthy residential suburbs) to moving "off-grid" by building private solar and wind plants.

   Despite multi-billion-rand government bailouts over the years, Eskom still carries a massive debt burden that consumes a significant portion of its operational revenue just to pay off interest.

1.2 The implications:

Eskom cannot generate enough cash from its daily operations to maintain its current power plants or invest in new infrastructure.

Because Eskom cannot survive on its own revenue, the national government must continuously step in with multi-billion-rand bailouts. This diverts critical state funds away from healthcare, education, and social grants.

Eskom's financial health is directly linked to South Africa's national economy. If Eskom risks defaulting on its loans, it threatens to drag down the entire country's sovereign credit rating, making borrowing more expensive for the whole nation.

2. **The infrastructure mismatch (The transmission gridlock)**

2.1 The Problems:

Eskom's physical high-voltage lines in the Eastern, Western, and Northern Cape are completely full. It cannot plug in any more wind or solar farms in these areas.

Eskom needs to build 14,000 kilometres of new transmission lines to connect renewable energy sources to the rest of the country, but it does not have the R440 Billion needed or the build speed to do so.

2.2 The Implications:

Eskom is forced to tell existing, privately-run green energy plants to turn off their supply because the wires cannot handle the load. This triggers massive financial penalty clauses that Eskom must pay out to these private producers for wasted energy.

International and local investors are walking away from new South African energy projects. They are unwilling to fund multi-billion rand solar or wind farms if Eskom cannot guarantee a grid connection.

South Africa's aging fleet of coal-fired power stations in Mpumalanga is nearing the end of its operational life. If Eskom cannot build transmission lines fast enough to connect new renewable energy before these old coal plants retire, the country will face a permanent structural energy deficit.

3. **Local distribution collapse (The "Last Mile" crisis)**

3.1 The Problems:

Massive volumes of illegal connections and meter tampering overload local substations and transformers.

Local transformers are physically overheating and exploding under the strain of unmetered electricity theft, especially during winter peaks.

3.2 The Implications:

Eskom generates and transmits massive amounts of electricity that it can never bill or collect money for because it is stolen at the local level.

Replacing a blown multi-mini substation or high-voltage transformer is expensive and logistically slow. When local infrastructure fails due to overload, entire communities are left without power for weeks at a time, sparking intense community anger and violent service delivery protests.

Eskom's engineering and maintenance teams are constantly stuck in firefighting mode—fixing broken local infrastructure and managing "load reduction" schedules—instead of focusing on long-term grid modernization.

The ultimate implications

The combined weight of these problems means Eskom can no longer exist as a traditional, all-powerful state monopoly. To survive, the utility is being forcefully "unbundled" into three separate independent entities (Generation, Transmission, and Distribution) under the National Transmission Company South Africa (NTCSA). This structural shift means Eskom is transitioning from being the *sole provider* of electricity to acting primarily as a *grid manager* that coordinates a complex network of private energy producers, independent transmission developers, and municipal agencies.

Last but not least, any significant energy deficit of magnitude carries with it serious economic implications, greater unemployment, tax shortfalls for government, greater service delivery failures and increased levels of social unrest.

Needs and solutions

To move past its current structural gridlock and financial distress, the South African electricity sector requires specific structural shifts These needs and solutions span across transmission infrastructure, municipal reform, and utility restructuring. And, critically important, put an end to the non-payment culture.

Resolving municipal debt and affordability

The critical needs:

1. Develop the political will and discipline to implement necessary solutions.
2. Stop the massive loss of revenue through the culture of non-payment threatening the power utility's financial sustainability by:
   2.1 Implement a policy of protecting the poor, pursuing the thief, and disciplining recalcitrant municipalities that fail to collect and remit electricity payments to Eskom.
   2.2 Implement a national media campaign to change the hearts and minds of communities and make it socially unacceptable to sabotage South Africa's new and developing democracy.
3. Restructure electricity tariffs to keep basic power affordable for poor households.
4. Modernise local municipal infrastructure to handle modern grid demands.

The solutions:

1. Legally bypass municipal billing departments that refuse to implement payment policy decisions by allowing Eskom or private contractors to step in, run local grids, and collect revenue directly from residents and businesses.
2. Replace old electricity meters with smart prepaid meters that automatically shut off power if tampered with or if a line is bypassed, reducing electricity theft.
3. Restructure how NERSA and local municipalities subsidise low-income households, ensuring that the poor receive a free lifeline block of power while higher-usage consumers pay cost-reflective tariffs.

Unlocking transmission bottlenecks

The critical needs:

- Implement tight project budgeting and financial management systems coupled with regular audits.
- Secure heavy financial investment in infrastructure outside of the constrained national budget.
- Raise specific funding to fast-track construction of the 14,000 km of high-voltage transmission lines.
- Streamline regulatory approvals for building grid infrastructure.

The solutions:

- Accelerate the Independent Transmission Projects (ITP) framework that allows private consortiums to fund, design, build, and operate high-voltage lines, which are then leased back to the state.
- Classify grid expansion infrastructure as Strategic Infrastructure Projects (SIPs) to cut down the time required for environmental impact assessments and land-access (servitude) negotiations.
- Implement advanced budget, financial management and grid management systems and dynamic line rating to minimise costs, squeeze higher transmission and revenue capacities out of new and existing transmission lines.

Transitioning Eskom into a modern utility

The critical needs:

- Implement non-negotiable planned maintenance schedules with necessary and budgeted fund allocations.
- Eliminate Eskom's dependency on direct taxpayer bailouts.
- Create a competitive market for energy trading.
- Transition aging coal plants without destroying local economies (Just Energy Transition).

The solutions:

- Analyse historical repairs and maintenance using AI to identify probable maintenance requirements, allocate budgets for and secure the funding for this planned maintenance
- Split Eskom cleanly into three independent corporate operating entities (Generation, Transmission, and Distribution).
- Transition the newly formed NTCSA into an independent market operator to create a fair marketplace where private IPPs, municipalities, and industrial consumers can buy and sell electricity directly to each other over the national grid.
- Convert decommissioned coal plants in Mpumalanga into hybrid hubs featuring large-scale battery energy storage systems (BESS), gas-to-power facilities, and solar plants, utilizing the existing grid infrastructure already built there.

Action plan

To address these interconnected challenges, South Africa cannot rely on a single government department or utility. A successful roadmap requires a coordinated, phased Action Plan driven by the National Transmission Company (NTCSA), the Ministry of Electricity and Energy, National Treasury, and the private sector.

This actionable blueprint is divided into short, medium, and long-term horizons to stabilize the grid, secure funding, and protect consumers.

Phase 1: Short-term action plan (Months 1–12)

Focus: Stabilise the municipal network, stop financial bleeding, and unlock immediate grid capacity.

- Develop and implement the national media campaign using SABCTV, DSTV etc.
- Install split-prepaid smart meters in high-risk load-reduction areas to isolate and cut off illegal bypasses automatically.
- Legally compel municipalities to pay electricity revenues directly into a dedicated escrow account for Eskom, preventing councils from using power sales to fund other municipal expenses.
- Install real-time weather and thermal monitoring sensors on saturated Cape transmission lines to safely increase their power capacity by 10–15% based on cooling wind conditions.
- Maintain the withhold equitable share allocations to non-compliant, high-debt municipalities while deploying Eskom technical teams to take over their billing distribution under Agency Agreements.
- Establish a national skills development pipeline with TVET colleges, apprenticeships, meter installers, renewale energy specialist and transmission construction skills.

Phase 2: Medium-term action plan (Years 1–3)

- Open the first bidding rounds for Independent Transmission Projects (ITPs), allowing private consortiums to build and maintain the required 14,000 km of lines under a "Build-Own-Operate-Transfer" (BOOT) model.
- Establish statutory fast track approval mechanisms with fixed decision deadlines for land-servitude acquisitions and to reduce environmental approval windows.
- Fully transition the NTCSA into an independent market operator with a transparent day-ahead trading platform, allowing Independent Power Producers (IPPs) and large industrial buyers to trade electricity freely.
- Introduce a separated tariff system that distinguishes between energy generation costs and grid connection/network costs. This ensures "off-grid" solar users still pay a fair share to maintain the physical wires they use as a backup.

Phase 3: Long-term action plan (Years 3–7)

- Install massive Battery Energy Storage Systems (BESS) at strategic transmission junctions and substation nodes to balance the intermittent nature of solar and wind energy.
- Complete the physical conversion of decommissioned coal stations in Mpumalanga into gas-to-power, synchronous condenser hubs, and solar fields, preserving local jobs and exploiting existing heavy-duty grid connections.
- Provide aggressive tax incentives and Special Economic Zone (SEZ) benefits for companies manufacturing transformers, high-voltage pylons, and utility-scale cables locally, insulating the grid roll-out from global supply chain shocks.

Future vision

By 2032, what success would look like would be South Africa successfully transitioned from an era of crippling energy scarcity into a dynamic, decentralized, and highly competitive electricity market. The successful execution of the unbundling process, private-public transmission partnerships, and strict municipal reforms has turned the energy sector from an economic anchor into the primary driver of industrial growth.

Here is what South Africa's energy landscape looks like in this realized future vision:

A decentralized and competitive energy marketplace

The National Transmission Company South Africa (NTCSA) operates as an entirely independent, digitalized, open-access market operator.

Electricity is traded like a liquid commodity on a transparent day-ahead market. Heavy industrial consumers, mines, and localized municipalities purchase power directly from a vast network of competing private wind, solar, gas, and hydro Independent Power Producers (IPPs).

Eskom Generation functions cleanly as one of many competing players in the market, operating a highly efficient, slimmed-down fleet of modern generation assets alongside private utilities.

An expanded, robust trans-continental grid

The historical transmission bottleneck has been permanently resolved through the Independent Transmission Projects (ITP) program.

Thousands of kilometres of new, ultra-high-voltage lines successfully traverse the Northern, Western, and Eastern Cape. This robust infrastructure seamlessly unlocks and transmits gigawatts of coastal wind and inland solar electricity directly to the economic heartlands of Gauteng and KwaZulu-Natal.

Massive Battery Energy Storage Systems (BESS) are positioned at every major grid intersection. These systems absorb excess renewable energy during midday peaks and discharge it smoothly into the national grid during evening demand surges, stabilizing voltage without relying on fossil fuels.

Digitized, self-sustaining municipalities and townships

The local distribution sector has been completely revitalized through automated infrastructure and commercial accountability.

Municipalities operate on modernized smart grids. Widespread prepaid split-metering and automated edge-computing systems detect and isolate line tampering or illegal bypasses instantly, eliminating local network overloads and eradicating "load reduction."

High-density communities, commercial office parks, and suburban homes have transitioned from passive consumers into active "prosumers." Equipped with rooftop solar and smart battery arrays, they feed excess electricity back into the municipal grid, receiving automated credits and creating a localized, highly resilient energy web.

A repurposed industrial heartland

The Mpumalanga province, once heavily polluted by aging coal plants, has completed its Just Energy Transition.

Retired coal-fired power stations have been successfully repurposed. Utilizing the heavy-duty grid infrastructure already built at these sites, the stations now operate as sophisticated waste-to-energy facilities, synchronous condenser plants for grid stability, and assembly plants for renewable components.

Local economies have shifted from coal mining to green industrial manufacturing, creating thousands of specialized technical jobs in transformer construction, solar assembly, and battery maintenance.

To summarize Eskom's main challenges, I have analyzed the comprehensive overview provided in the document. Eskom, South Africa's state-owned electricity utility, faces a complex set of interrelated problems that threaten its financial sustainability, operational reliability, and the broader national economy. Here are the key challenges, with explanations and examples:

1. Culture of Non-Payment and Municipal Debt

- **What:** Widespread non-payment for electricity by individuals, businesses, and especially municipalities. Municipalities owe Eskom over R110 billion, and this debt continues to grow.
- **Why:** This culture originated as a form of political protest during apartheid but has become entrenched due to economic hardship, poor billing systems, and a belief that basic services should be free. Many municipalities collect payments but do not remit them to Eskom.
- **Example:** Four municipalities alone account for nearly half of the total municipal debt. Eskom is legally required to supply electricity even to defaulting councils, draining its cash flow.

2. Legacy Corruption, State Capture, and Governance Failure

- **What:** Eskom has suffered from decades of mismanagement, procurement fraud, and deliberate sabotage by criminal networks seeking inflated repair contracts.
- **Why:** Corruption and poor oversight led to inflated costs, delayed maintenance, and operational decline. The utility has required nearly half a trillion rand in government bailouts.
- **Example:** Eskom paid drastically marked-up prices for basic goods and unsuitable coal, and suffered from deliberate infrastructure sabotage.

3. Ageing and Unreliable Generation Fleet

- **What:** Most of Eskom's coal-fired power stations are old (many 40–50 years), leading to frequent breakdowns and high maintenance needs.
- **Why:** Delayed maintenance and underinvestment have left the fleet unreliable, causing rolling blackouts (load shedding) in the past.
- **Example:** Stations like Camden and Hendrina are past their original lifespan and suffer from high unplanned breakdowns.

4. Inadequate Transmission Capacity (Grid Bottlenecks)

- **What:** The national grid cannot transmit all the electricity generated, especially from new renewable projects. Over 53 GW of potential new capacity is stranded.

- **Why:** The grid was built around coal plants in Mpumalanga, but the best wind and solar resources are far away. Eskom needs 14,000 km of new transmission lines but is building at a fraction of the required pace due to funding and regulatory delays.
- **Example:** Private wind and solar farms are sometimes ordered to shut down because the grid cannot absorb their power, leading to compensation claims against Eskom.

5. Financial Unsustainability and Tariff Increases

- **What:** Eskom cannot generate enough revenue to cover its costs, leading to repeated government bailouts and rising electricity tariffs.
- **Why:** The combination of non-payment, debt, and operational inefficiency forces Eskom to raise tariffs, which in turn drives more customers off-grid or into non-payment, creating a financial death spiral.
- **Example:** Tariffs have risen far above inflation, pricing millions out of the market and shrinking the pool of paying customers.

6. Local Distribution Collapse ("Last Mile" Crisis)

- **What:** Illegal connections, meter tampering, and theft overload local infrastructure, causing transformers to fail and leaving communities without power.
- **Why:** Poor municipal management and lack of enforcement allow widespread electricity theft, making it impossible for Eskom to collect revenue for much of the power it supplies.
- **Example:** In some areas, up to 30% of purchased electricity is lost before it can be billed due to theft and technical losses.

7. Structural and Regulatory Challenges

- **What:** The electricity market and municipal distribution model are outdated and financially unsustainable.
- **Why:** Eskom's monopoly is being dismantled, but the transition to a decentralized, competitive market is complex and slow.
- **Example:** The unbundling of Eskom into separate Generation, Transmission, and Distribution entities is ongoing, with the aim of introducing competition and attracting private investment.

Summary Table of Main Challenges:

Challenge	Description/Example
Non-payment & Municipal Debt	R110bn+ owed, entrenched culture, poor billing, affordability crisis
Corruption & Mismanagement	Procurement fraud, sabotage, state capture, half-trillion rand in bailouts
Ageing Generation Fleet	Frequent breakdowns, old coal plants, unreliable supply
Transmission Bottlenecks	Grid cannot absorb new renewables, 14,000 km of new lines needed
Financial Unsustainability	Tariff hikes, shrinking customer base, repeated bailouts
Local Distribution Collapse	Illegal connections, transformer failures, up to 30% technical losses
Outdated Market Structure	Monopoly model failing, slow transition to competitive, decentralized market

Implications:

Eskom's crisis threatens South Africa's economic stability, credit rating, and social cohesion. Without urgent reforms, the country risks permanent energy deficits, higher unemployment, and increased social unrest.

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