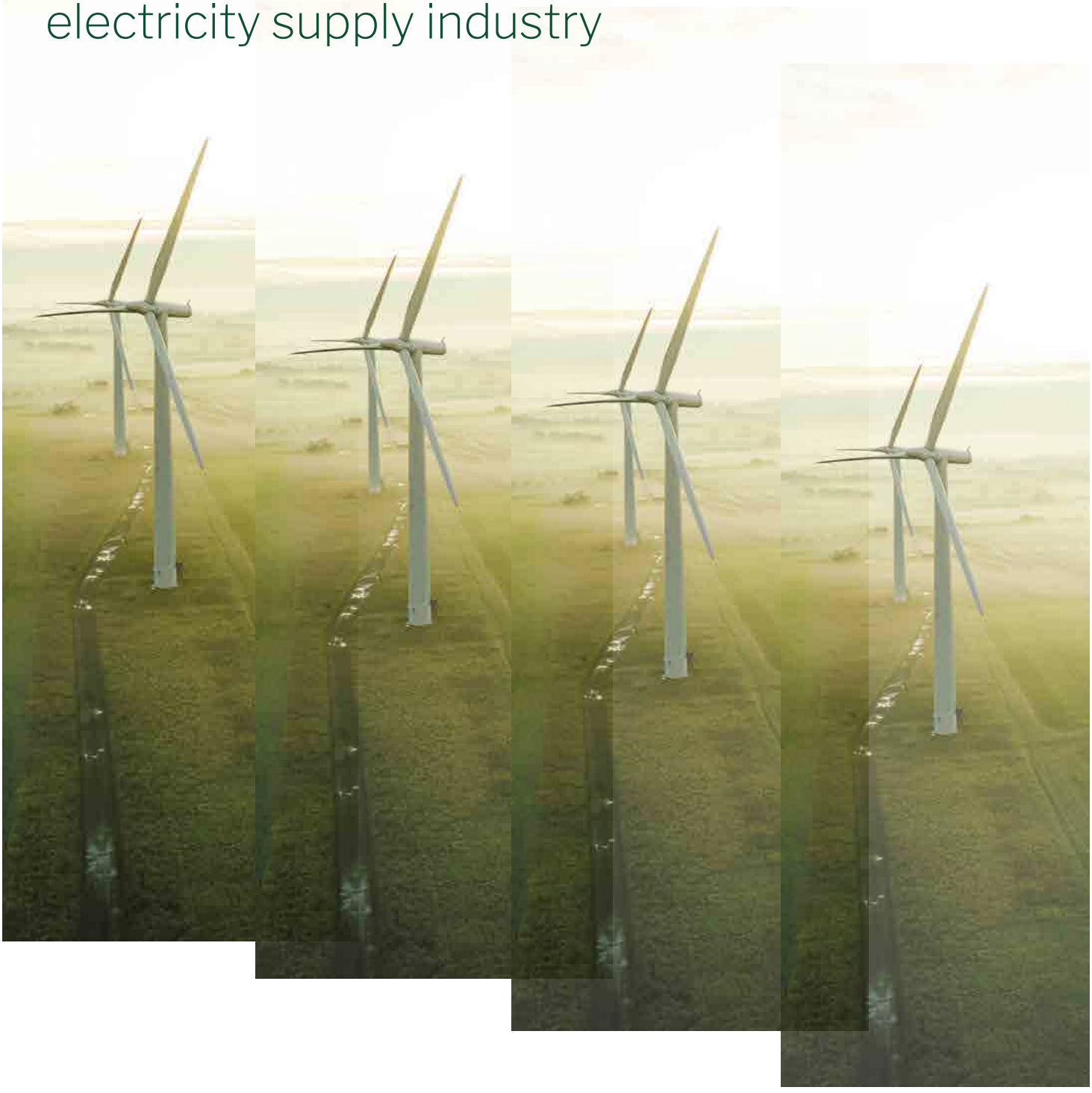
South Africa's energy prospects

Insights into South Africa's electricity supply industry



CIB

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Group Head Office: 135 Rivonia Road, Sandown, Sandton, 2196, South Africa
Postal Address: PO Box 1144, Johannesburg, 2000, South Africa
+27 11 294 4444
group.nedbank.co.za

Produced by African Energy and Nedbank
African Energy editorial team: John Hamilton, Tonderayi Mukeredzi, David Burles
Nedbank team: Ephraim Sehloho, Refilwe Magano, Crystal Huntley

www.africa-energy.com

Design by Aaron Griffiths

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A call to action for South Africa's energy transition

Anél Bosman, Group Managing Executive, Nedbank Corporate and Investment Banking

We're standing at an inflexion point in South Africa's energy story, and the choices we make now will carry forward for decades, shaping how we grow as a country, protect what matters, and create access and opportunity that reaches more people.

South Africa is at a critical juncture in its energy journey. The decisions made today will have long-lasting impacts on the nation's growth, environmental protection, and the creation of opportunities for all its citizens. At Nedbank Corporate and Investment Banking (CIB), we have always believed that energy finance extends beyond mere infrastructure development. It is about making a meaningful impact across communities, industries, and the broader economy. Our role is to be present, to help design what is possible, and to partner with those working towards tangible outcomes.

Over the years, Nedbank CIB has supported a wide range of projects across the energy spectrum. From large-scale renewable energy projects to embedded generation, from early green loans to some of the country's first taxonomy-aligned funding structures, we have witnessed how momentum builds when shared vision and investment are structured around a common purpose. This Energy Book reflects that momentum. It showcases the shift happening in how demand is shaped, how projects are financed, and how collaboration is evolving. However, we still face significant constraints. What matters now is how we respond with discipline and a belief in what can be achieved when we work together.

Executive summary

South Africa's electricity supply crisis has seen significant improvements, but challenges remain. Structural and commercial changes initiated by the crisis are driving ongoing reforms in the electricity sector.

The crisis has redefined relationships between the state, Eskom, transmission system operators (TSOs), power consumers, and the private sector. After experiencing 262 days of loadshedding in 2023, the situation improved in 2024 with no power cuts in the second and third quarters. Eskom exceeded maintenance targets and improved the energy availability factor (EAF) of its plants from 57% to 67% by July 2024, though still below the 75% target in the 2019 Integrated Resource Plan (IRP).

Several factors contributed to this improvement. Lower demand due to warm winter temperatures and increased self-generated solar power played a role. There was a significant increase in small-scale embedded generation (SSEG) and solar PV installations, with 5.5GW of rooftop solar added by December 2023. Additionally, new capacity additions included 3,461MW added to the grid in 2023 and 3,091MW in the first eight months of 2024. Kusile Coal units returned to service, adding 800MW to the grid.

Despite these improvements, electricity supply remains unstable due to constrained generation capacity. Excess demand is managed through load reductions, imports, and open cycle gas turbines (OCGTs). The lack of grid capacity, particularly in Northern, East, and Western Cape, threatens the integration of new projects. This issue led to fewer projects being tendered under REIPPPP's bid windows.

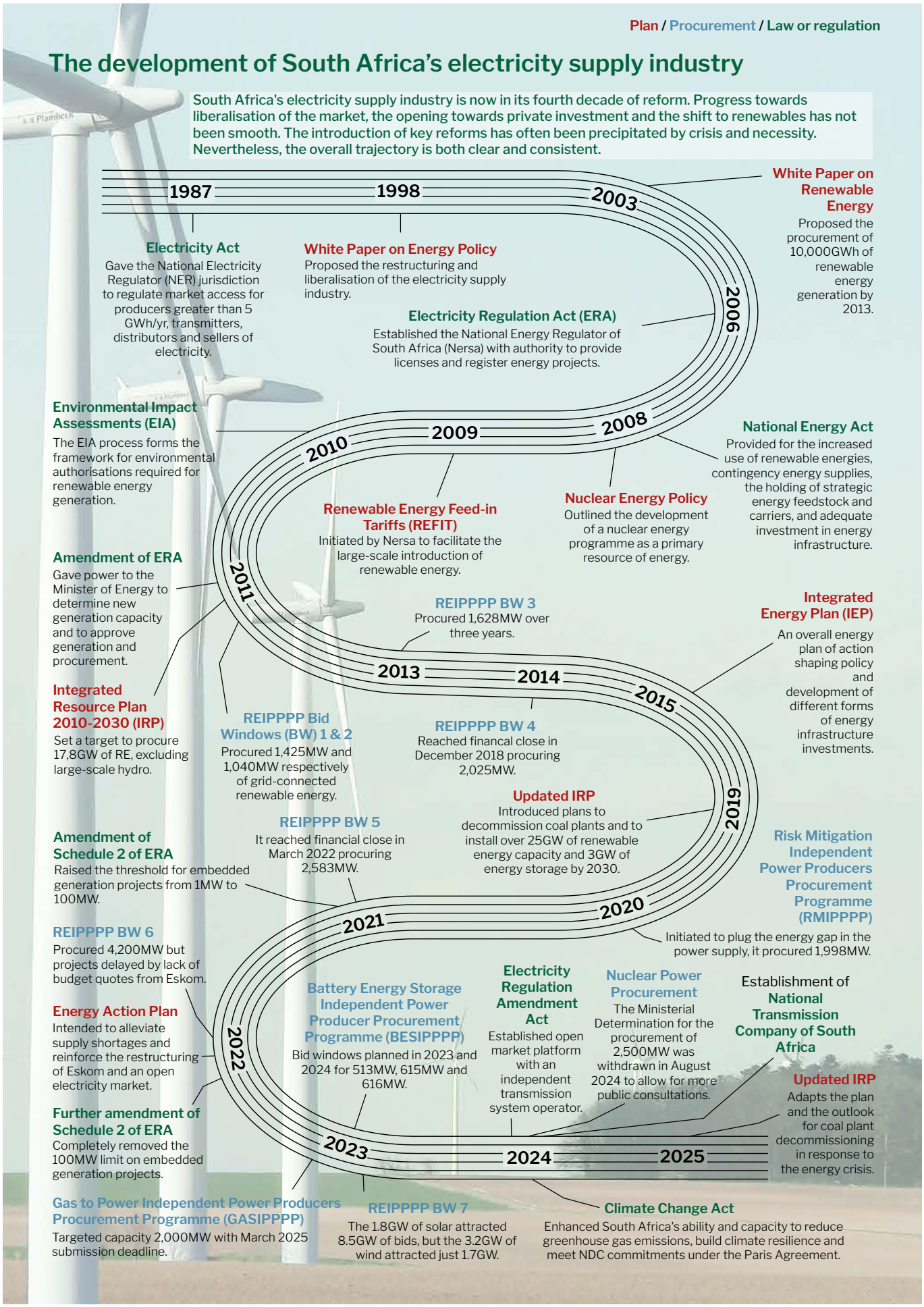
Looking ahead, the next phase of on-grid private-sector funded renewable energy additions has the potential to transform the electricity supply industry, contingent on the development of necessary transmission infrastructure. The Government Energy Action Plan (EAP) projects the addition of 38GW of capacity between 2024 and 2030, with significant contributions from the private sector and renewable energy sources.

South Africa aims to reduce greenhouse gas emissions to 350-440MtCO_2e by 2030. Eskom requires approximately ZAR1.5 trillion to develop new energy infrastructure by 2030. While South Africa has made strides in addressing its electricity supply crisis, sustained efforts and investments are crucial to achieving stable and reliable power supply, particularly through renewable energy and improved grid infrastructure.

Plan / Procurement / Law or regulation

The development of South Africa's electricity supply industry

South Africa's electricity supply industry is now in its fourth decade of reform. Progress towards liberalisation of the market, the opening towards private investment and the shift to renewables has not been smooth. The introduction of key reforms has often been precipitated by crisis and necessity. Nevertheless, the overall trajectory is both clear and consistent.



South Africa data trends

South Africa's electricity supply industry faces the future

- The path of restructuring and innovation is unstoppable.
- Loadshedding is over for now thanks to sub-optimal demand, but the problems which caused it still need fixing.
- New generation capacity has been added but much more is needed.
- Transmission expansion plans will transform the sector.
- The current generation or transmission expansion plans will transform the sector.
- The objectives will only be attained with private sector participation.

The worst of South Africa's electricity supply crisis may now be over, but enormous challenges remain, and the structural and commercial changes that the crisis made necessary now have a life and momentum of their own. All the evidence shows that the decisive shifts that have already occurred will be followed by yet more reform.

Perhaps the most fundamental change that has already taken place is a reformulation of the relationships between key electricity industry participants: that is the state, the state-owned utility (Eskom) and transmission system operator (TSO), consumers of power, and the private sector. Precipitated by an existential crisis at the utility, Eskom, this reformulation has triggered what now looks to be an unstoppable cascade of restructuring and innovation.

Multi-year failures at Eskom reached their nadir in 2023 when the country experienced 262 days of loadshedding. But during 2024 the power supply situation has improved with reduced load-shedding experienced in the first quarter of the year and no power cuts at all in the second and third quarters. In its six-month summer period forecast, running from 1 September 2024 to 31 March 2025, the utility said there should be no loadshedding – so long as unplanned outages stayed at 13GW or below.

This forecast proved correct. Thanks to weaker demand and the return of generation units after maintenance, there was no load-shedding from March 2024 until the end of the year. According to Nedbank's Energy Tracker load-shedding resumed at a lower level in Q1 2025 but the trend is downwards. It declined from more than 23GW in 2023 to just over 4GW in 2024. This does not mean the risk has been eradicated. In a worst-case scenario, the loss of critical capacity from the Matimba, Kendal, and Medupi coal-fired plants would result in stage 13 load-shedding.

> The next phase of on-grid private-sector funded renewable energy additions has the potential to change South Africa's electricity supply industry beyond recognition

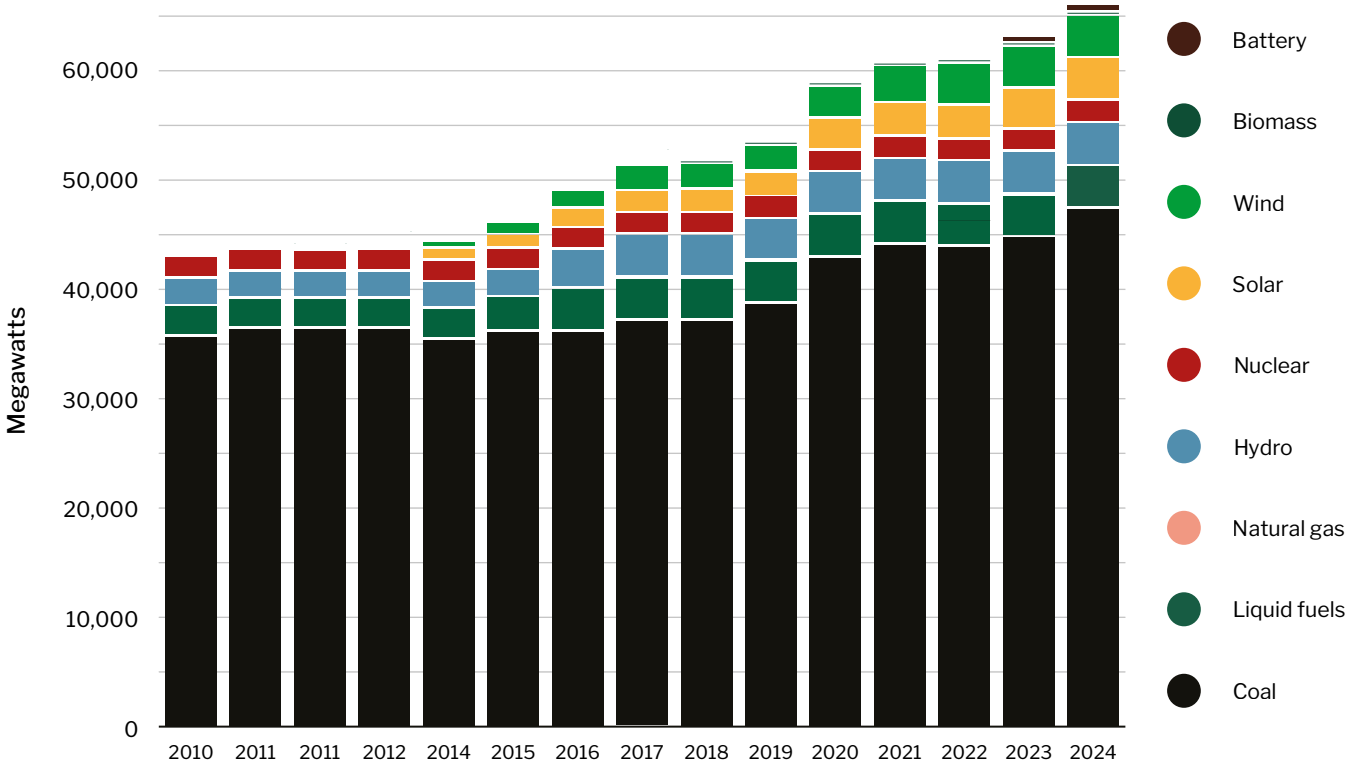
Eskom's electricity availability factor (EAF) increased to 60% in 2024 a level previously experienced in 2021, and still well below that of previous years and also below the 75% envisaged in the 2019 Integrated Resource Plan (IRP).[1]

Demand has remained below its 2019-2021 average, despite a recent increase. This is because so many businesses and households have shifted to self-generated solar in response to the power crisis. It is, therefore, a permanent reduction.

Meanwhile dispatchable power has exceeded the level reached in 2023 but is still below its 2019-2021 average.

1 Integrated Resource Plan 2019, Department of Mineral Resources and Energy: www.dmre.gov.za/Portals/0/Energy_Website/IRP/2019/IRP-2019.pdf

Grid-connected installed capacity, 2010-2024



Source: African Energy Live Data © African Energy 2024 (www.africa-energy.com)

A rapid increase in behind the meter generation has also helped mitigate the power supply crisis. Small scale embedded generation (SSEG) registrations increased by 474% and solar PV installations by 138% between December 2022 and December 2024. As a consequence, the amount of utility-scale, distributed and SSEG installed capacity increased from less than 2GW to just under 10GW over the period. Rooftop solar installations increased from about 2.5GW to about 6GW. These trends were driven by increasing electricity prices, decreasing PV technology costs, tax incentives and financing mechanisms.

According to industry newsletter African Energy, the authorities estimate there is an exploitable market in residential, commercial and industrial rooftops across provinces of about 10GW that can be unlocked by 2030.[2]

Additionally, specialist industry database African Energy Live Data shows that ongrid solar capacity rose steadily throughout 2023 with the addition of hundreds of megawatts from the risk mitigation independent power producer procurement (RMIPPP) programme. The trend of large merchant solar PV generation plants wheeling power through the grid and the start up of many small, embedded power projects also started in 2023. This trend tailed off during 2024.

The impact on total ongrid installed capacity during 2023 was dampened by the removal from service and rehabilitation of three units at Kusile coal following a flue gas duct failure at Unit 1 in October 2022. This took out 2,400MW of capacity for most of the following year and plunged the country into stage-6 load shedding. They were temporarily fixed in late 2023 and permanent repairs started in July 2024 and will be completed in mid-2025. Meanwhile in June 2024, Kusile Coal unit V started operating, adding 800MW to the grid. So the general trend of gradually increasing capacity over the past two years masks a good deal of underlying fluctuations.

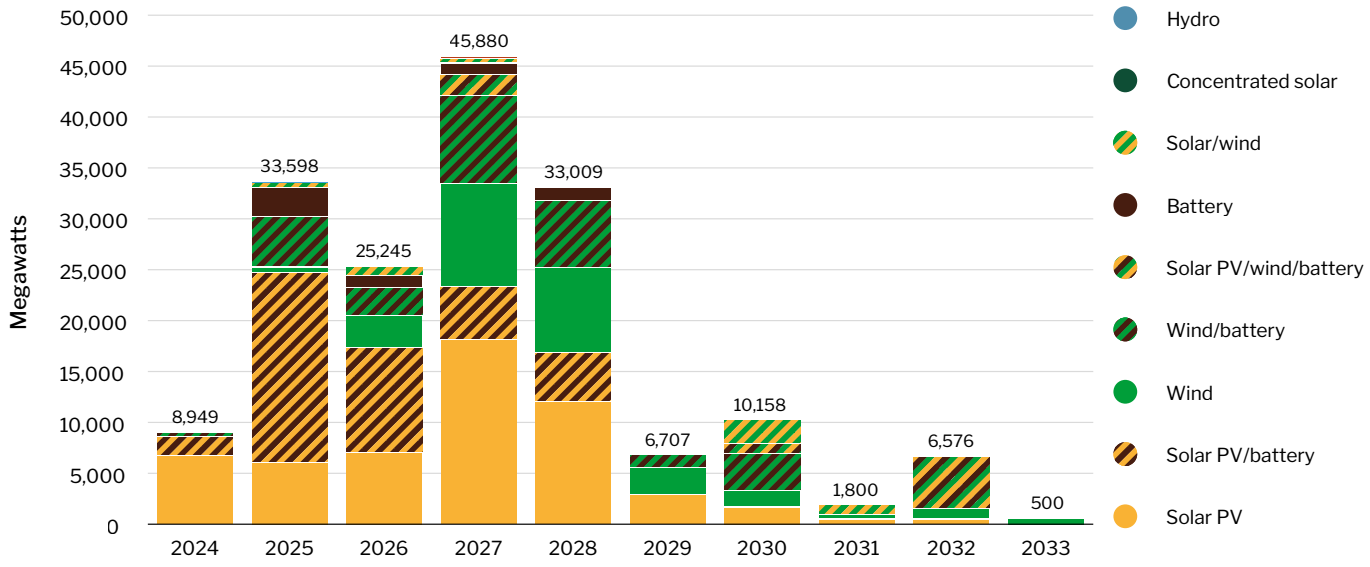
The reconstructed 720MW Medupi Unit IV, which has been offline following a generator explosion on 9 August 2021, is expected to return to service later in 2025.

The findings of Nedbank's own Energy Tracker are that despite the improvement in Eskom's EAF, electricity supply is still unstable as generation

2 South Africa: Rooftop solar has '10GW potential' – blockages can be overcome, African Energy, 28 February 2023: www.africa-energy.com/news-centre/article/south-africa-rooftop-solar-has-10gw-potential-blockages-can-be

Grid-connected renewable capacity potential, 2024–2033

Based on responses to the 2024 grid survey



Source: National Transmission Company of South Africa, 2024 Grid Survey

capacity remains constrained. So excess demand is still being compensated for through load reductions, OCGT usage and imports.

The evidence of continued energy insecurity is shown by the ongoing reliance on the compensatory load and very high levels of unplanned outages. The achievement of stable electricity supply requires a sustained improvement in generation capacity, particularly in renewable energy and less dependence on the compensatory load.

But it is the next phase of on-grid private-sector funded renewable energy additions which have the potential to change South Africa's electricity supply industry (ESI) beyond recognition, providing the necessary transmission infrastructure can be built in time.

According to the results of the National Transmission Company of South Africa (NTCSA)'s 2024 Renewable Energy Grid Survey (SAREGS),[3] the total pipeline of potential renewable energy projects to 2032 amounted to about 172GW. The survey recorded that the 2024 pipeline was already nearly 9GW, increasing to 34GW in 2025 and 46GW in 2027.

The grid survey is not a forecast of what is likely to happen. If fully implemented the capacity recorded in responses related to nearly 500 projects would quadruple installed capacity from its current level. In fact, many of the projects contributing to these numbers may not secure a grid connection, reach financial close or even conclude a power purchase agreement (PPA).

The figures do, nevertheless, show the expectation of what could be possible for privately-financed renewable power generation in South Africa.

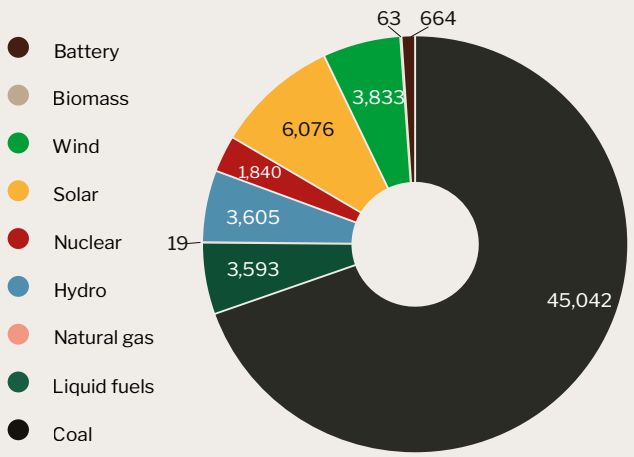
Pipeline analysis

The March 2024 update to the government's Energy Action Plan (EAP)[4] provides a more measured but also ambitious vision of the future. It projects the addition of 38GW of capacity to the national grid between 2024 and 2030 from various government procurement and private sector sources. The EAP update forecast that 3.9GW of the projected additions would be added in 2024, mainly from the private sector, SSEG, and REIPPP wind.

The EAP targets a further 7.1GW of additions in 2025, with major contributions from the private

3 Renewable Energy Grid Survey (SAREGS), 2024, NTCSA: www.ntcsa.co.za/south-africa-renewable-energy-grid-and-survey.
4 Energy Action Plan, National Energy Crisis Committee: www.stateofthenation.gov.za/takechargesa/energy-action-plan.

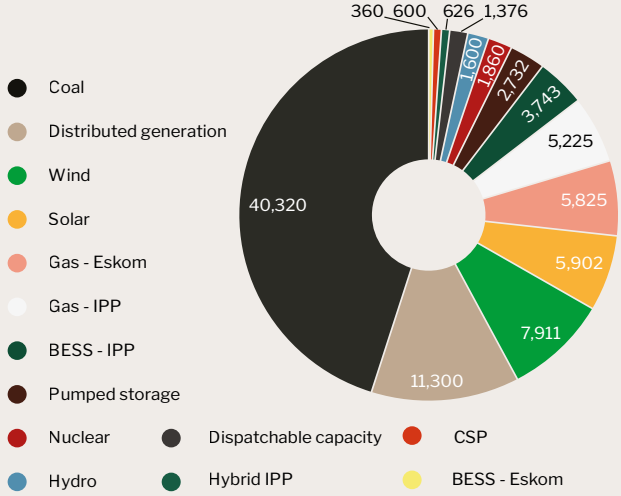
Grid-connected energy mix, 2024 (MW)



Source: African Energy Live Data © African Energy 2024 (www.africa-energy.com)

Energy mix target, 2030 (MW)

Based on determinations from the 2023 update to the Integrated Resource Plan



Source: Department of Mineral Resources and Energy, IPPPP Quarterly Report, Integrated Resource plan 2023 (publ. Jan 2024)

sector and REIPPP solar. The plan anticipated that additions of new capacity will peak in 2026 with 8.6GW from wind and solar, with a further 18GW expected in the years to 2030, two-thirds of which would be added in 2027 and 2028.

The overall EAP target is somewhat more than the total envisaged in the emerging plan from the Horizon One (2023-2030) analysis contained in the 2023 update to the IRP. This plan envisaged the addition of 29GW from the baseline 2023 installed capacity of about 60GW.

The energy mix target in this plan is notable for the inclusion of about 7GW of natural gas-fired capacity, 3.6GW of solar PV, 4.5GW of wind, and a further 6.3GW of unspecified distributed generation capacity. While it also envisages a reduction of coal-fired capacity from 45GW to 40GW, this is still 7GW more than the total envisaged in the 2019 IRP.

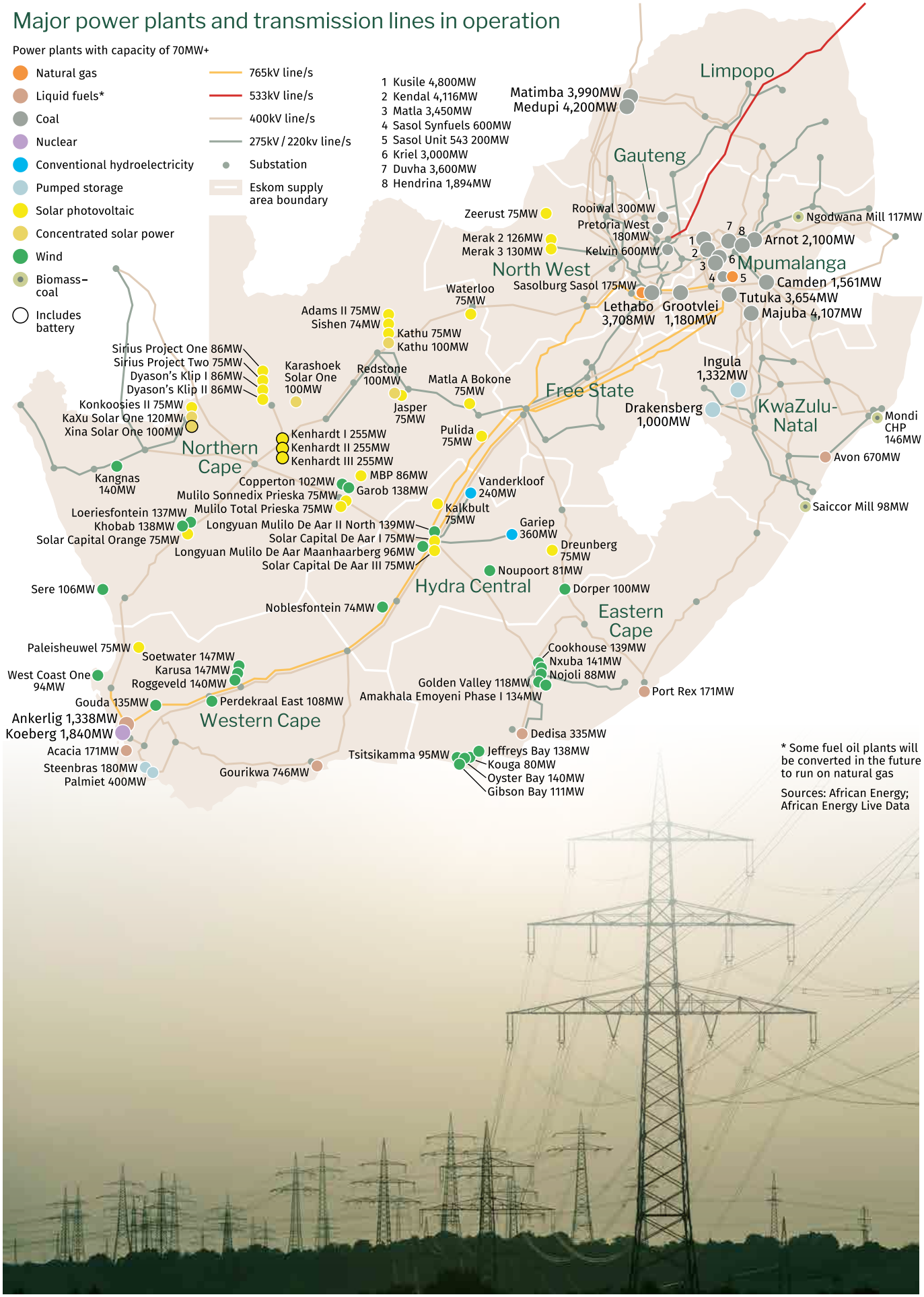
In the 2019 IRP, DMRE proposed shutting down over 10.5GW of coal generation by 2030 and 35GW by 2050 as part of the Just Energy Transition plan. While the intention remains, and renewable ambitions have vastly increased, it appears the decommissioning of existing generation will happen more slowly than first envisaged. The draft 2024 IRP proposes several updated scenarios for generation capacity, one of which is delayed shutdown of coal-fired generation.

Despite all the efforts to add new generation capacity, the lack of grid connection capacity is threatening the integration of more capacity to the grid. This problem is particularly acute in Northern, East and Western Cape supply areas preferred by developers for utility-scale wind projects. The lack of grid capacity has caused fewer projects to be tendered for under REIPPPP's bid window five. In December 2022, 23 projects with a combined capacity of 4.1GW were excluded from the sixth bid window of the REIPPP because of grid exhaustion. REIPPP bid window 7 projects also remain at risk with new capacity reduced to 5GW.

This is likely to be the subject of ongoing debate. Due to the dominance of coal, South Africa is one of the world's major emitters of greenhouse gases (GHGs). The authorities plan to reduce economy-wide GHG emissions to around 350-440MtCO2e by 2030. To align the electricity sector with net zero targets, Eskom will need to find a way to accelerate the transition away from coal.

According to one estimate, the utility requires approximately ZAR1.5tr to develop new energy infrastructure by 2030. Emerging from a financial crisis with large debts and limited ability to borrow from capital markets, it needs alternative solutions. Both Eskom and South Africa's wider electricity generation sector will take their next steps in partnership with private enterprise and private finance.

Major power plants and transmission lines in operation



* Some fuel oil plants will be converted in the future to run on natural gas

Sources: African Energy; African Energy Live Data

Key institutional players

REGULATION

IPP Office

Set up in 2010 under DMRE to procure renewable and non-renewable energy generation capacity from the private sector under the state power procurement programmes. The **Independent Power Producers Procurement Programme** Office ("IPP Office") works with Nersa to determine new energy generation capacity requirements.

Nersa

Established in 2005 to independently regulate the energy sector, the **National Energy Regulator of South Africa** is responsible for the licensing, registration of new energy infrastructure, pricing and setting of tariffs and rules and codes for the electricity, piped gas and petroleum industries.

EOSS

Launched in 2023 to facilitate, authorise and expedite applications for new generation projects from IPPs and SOEs, through the National Energy Crisis Committee (NECOM). The **Energy One Stop Shop** works with IPPs and SOEs outside of the government's bid window projects to assist them navigate through regulatory challenges.

POLICY

The President's Office

The Presidency houses the Presidential Climate Commission – an independent body established in December 2020 to oversee and facilitate a just and equitable transition towards a low-emissions and climate-resilient economy. It also hosts Infrastructure South Africa (ISA) – an entity that oversees the preparation, appraisal and evaluation of a market-ready infrastructure project pipeline including energy projects to support the Infrastructure Investment Plan and the National Infrastructure Plan 2050.

DEE

A new ministry created in June 2024 by merging the Minister of Electricity in the Presidency and the energy section of the now defunct Department of Mineral Resources and Energy. The **Department of Energy and Electricity** will be the custodian of energy policies, regulation and energy security by determining new energy generation capacity.

NECOM

The National Energy Crisis Committee was formed in 2022 to deal with the energy crisis by fixing Eskom, adding new sources of power, and implementing the EAP. Located in the Presidency, it reports directly to an inter-ministerial committee, is led by the Electricity and Energy Minister, and includes high-level officials from across government and Eskom.

NTCSA

The **National Transmission Company of South Africa** is the first of Eskom's three entities to be unbundled; it started operating on 1 July 2024. It will own and operate the national transmission system, act as systems and market operator and be an international electricity trader. Ownership of the grid will remain under NTCSA but with wider private sector participation.

TRANSMISSION

Municipalities

GENERATION

Independent Power Producers

Eskom Holdings SOC Ltd

State-owned power utility Eskom Holdings SOC Ltd was historically responsible for generation, distribution and transmission of electricity. But its role has evolved in response to phases of reforms and crises in the power sector.

Eskom Generation

Eskom owns and operates 35 power stations with nameplate installed capacity of about 47GW.

SAPP

Bilateral export agreements and day ahead markets

C&I offtakers

Municipal and local customers

DISTRIBUTION

Eskom Distribution

Eskom supplies about 50% of distribution customers with the rest supplied or distributed by about 180 municipalities to other end-users.

Energy Council of South Africa

The Energy Council of South Africa is a voluntary association that brings together CEOs of public and private sector companies, business/industry associations and finance institutions with significant presence active participation in the energy sector. Its objectives are to ensure a unified business voice contributing to a national energy vision and pathway to Net Zero; to play a role in the national energy transition; to promote enabling investment; and to help advance energy policy, regulatory certainty and business confidence.

South Africa's C&I opportunity

The structural shift in South Africa's power supply could lead the way for all Africa

- The total capacity of renewable energy projects in the private sector pipeline over the coming eight years nearly tripled over the past two years.
- There is a growing pipeline of over 22GW of projects with an investment value of R393 billion.
- Solar PV technology has dominated registrations at Nersa.
- The first private sector projects to be registered following the legislative changes have started operating
- Rooftop solar PV and small-scale embedded generation now account for about 4% of South Africa's electricity generation.
- The biggest blockage to adding more capacity is the lack of grid connection capacity.
- Aggregators will become an increasingly vital part of the energy transition as the market liberalises.

The dramatic expansion of South Africa's commercial and industrial (C&I) electric power market over the past two years may represent the single biggest structural shift in the industry in the whole African continent.

According to National Transmission Company of South Africa (NTCSA)'s 2024 South African Renewable Energy Grid Survey (SAREGS), the total capacity of renewable energy projects in the private sector pipeline over the coming eight years has nearly tripled from 63GW in 2022 to 172GW in 2024. The trigger for this phenomenal growth was the increase in the licensing threshold for new embedded generation projects from 1MW to 100MW in August 2021 followed by the complete lifting of the threshold in December 2022.

This milestone decision was introduced as part of Operation Vulindlela, a joint programme of President Cyril Ramaphosa's presidency and the National Treasury targeting major structural reforms to reorient the economy. It has enabled companies and municipalities to generate and sell electricity or procure their own power from independent power producers (IPPs) through power purchase agreements without the need of a generation license.

The background to the decision was the power supply crisis at Eskom. Constant breakdowns at its ageing fleet of coal-fired power plants, which provide about 85% of the country's electricity, meant it was unable to supply adequate and regular electricity to the market. This resulted in a debilitating period of outages and load-shedding.

But other factors also came into play. These included commitments to address climate change which have driven many businesses to adopt clean and sustainable energy technologies.

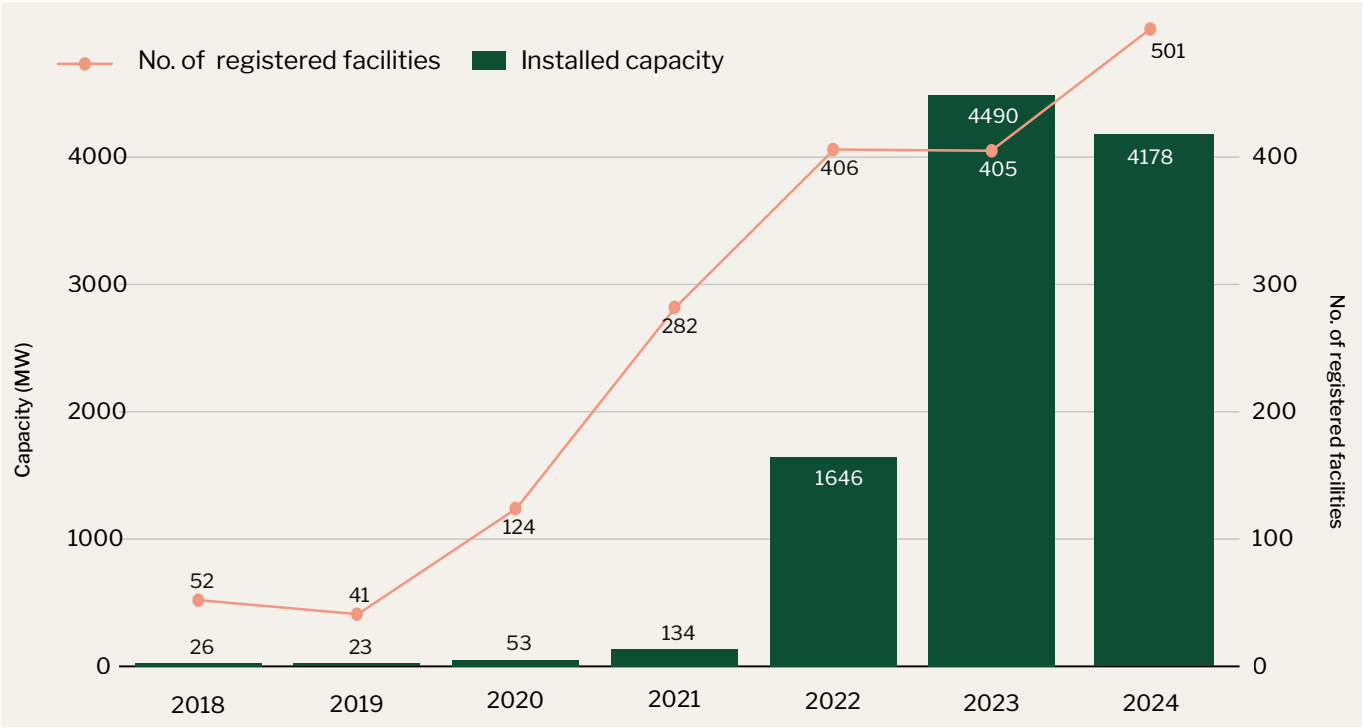
In April 2024, an official report on energy market reform estimated that the change had unlocked a substantial amount of private investment in new generation capacity, describing "a growing pipeline of over 22GW of projects with an investment value of R393 billion."

Much of this capacity is based on deals taking place in the market rather than being led by the government. True to the reforms intention that licences are no longer necessary, most of this pipeline is not registered with the National Energy Regulator of South Africa (Nersa) – although some is.

Since it began registering projects in 2018, Nersa's list of projects has increased from 52 plants with a capacity of 26MW to 1,811 projects with a combined capacity of 10.5GW, valued at ZAR202.7bn, by end-2024. Energy generation by the private sector reached its peak in 2023 when approved capacity nearly tripled to 4,490MW from 1,646MW in 2022.[1]

1 Nersa Media Statement, 26 February 2025: www.nersa.org.za/media-statement-nersa-registers-143-new-generation-facilities-in-quarter-three-of-2024-25.

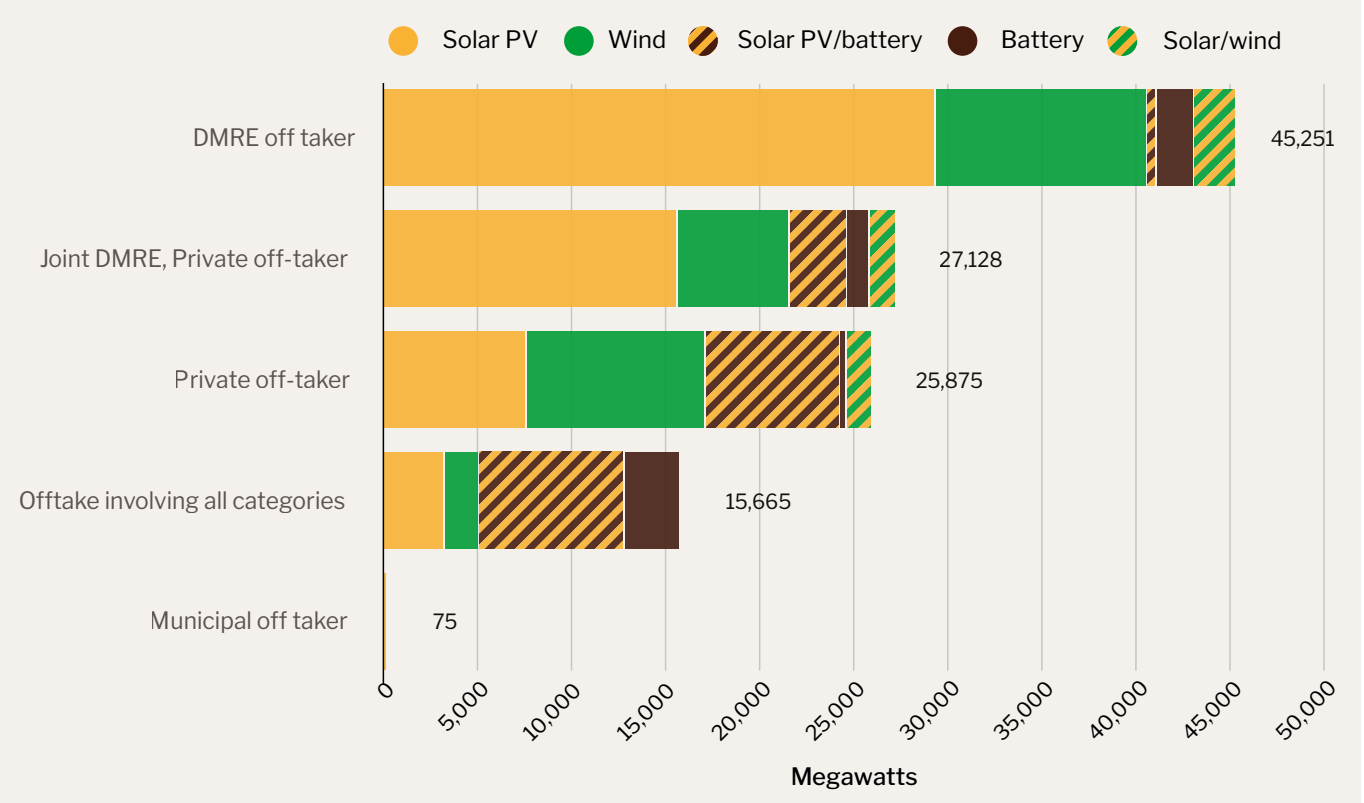
Generation facilities registered with Nersa, incremental additions 2018–2024



Source: Nersa

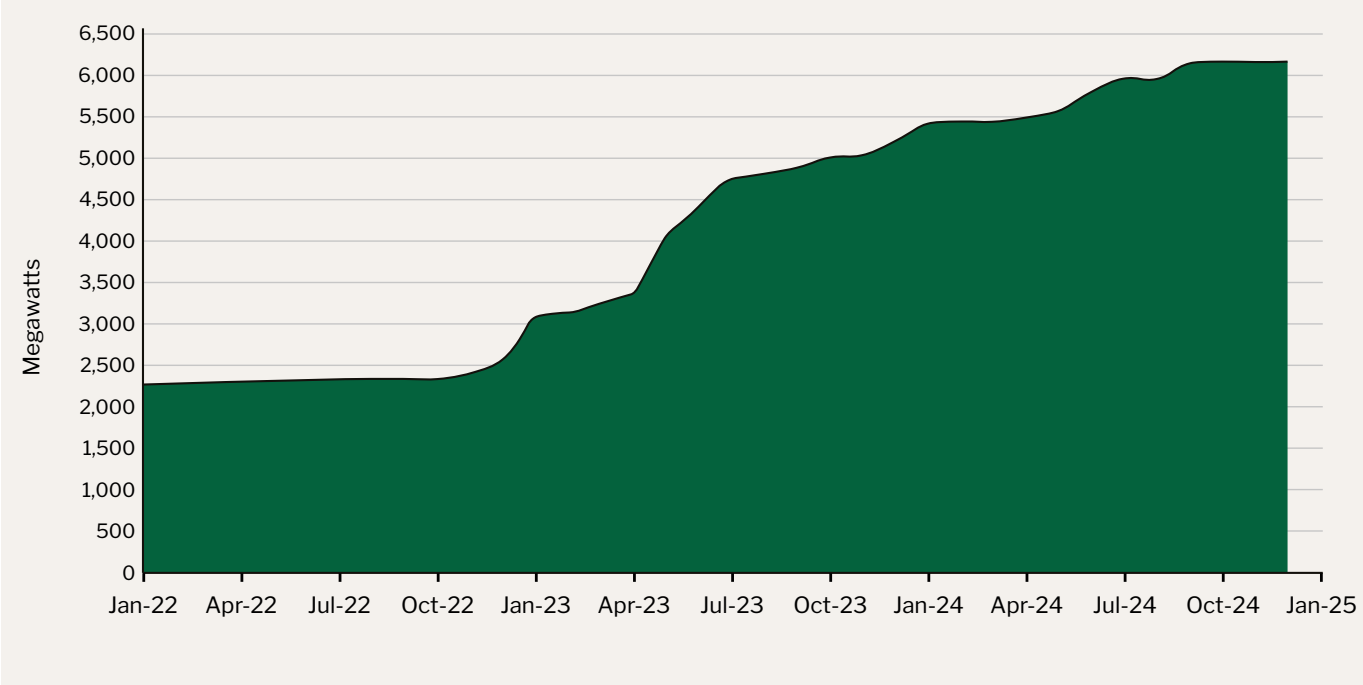
Intended offtakers of renewable energy

State vs private offtake from pipeline renewable energy projects



Source: National Transmission Company of South Africa

Roof-top solar additions 2022–2024



Source: Eskom data

But this is only part of the story. NTCSA's grid survey shows that private sector development of renewable power for C&I offtake has – in the space of just two years – become a major driver of development. 44% of the 172GW pipeline revealed by the survey is represented by solar PV projects at various stages of development while wind projects comprise 28% of the list and battery projects 27%.

The survey also shows that of the potential grid connections required by planned renewable energy IPPs, somewhat over one-third are being developed exclusively in the expectation of offtake via a Department of Mineral Resources and Energy (DMRE) IPP procurement programme. A further third are based on either DMRE or private sector offtake. The remainder are focused entirely on private sector or municipal offtake.

First approved private projects start operating

Already, some of the first private sector projects to be registered following the legislative changes have started operating. A 50MW project approved by Nersa in 2021 started operating in August 2022. Other early projects are making progress including a large wind energy facility in Mpumalanga and other behind-the-meter schemes. Some wheeling projects have also gone ahead, including a solar PV plant in North West province which started despatching power to a private mining offtaker in April 2024, having begun construction in September 2022.

The future of embedded generation in South Africa

Where these projects have led, many more will follow. The options open to C&I offtakers anxious to ensure security of supply while also meeting their decarbonisation targets now range from installing rooftop solar, through to behind-the-meter utility scale solar systems, of battery energy storage systems (BESS) and wheeling.

As of December 2024, Eskom estimated that 6.2GW of behind-the-meter rooftop solar capacity had been installed, up from about 2.5GW in July 2022.[2] This increase was buoyed by renewable energy and rooftop solar tax incentives and the energy bounce back loan scheme for small scale embedded generation, introduced in March and April 2023. Rooftop solar PV installation together with small-scale embedded generation now accounts for about 4% of South Africa's electricity generation. The subsidies however exclude large-scale renewables.

2 Eskom Weekly Status Reports Week 9:
www.ntcsa.co.za/wp-content/uploads/2025/03/Weekly_System_Status_Report_2025_w09.pdf

A further boost for solar PV installation has been a major reduction in the cost of solar modules. Their cost has come down by about 50% during the past year while the cost of batteries has fallen by about 40%. Demand has risen commensurately. South Africa imported an estimated ZAR17.5bn worth of solar panels in 2023, up from ZAR5.6bn in 2022.

Rooftop and behind-the-meter solar PV projects have the fewest barriers preventing their progress. The biggest blockage to adding more capacity is the lack of grid connection capacity. This problem is particularly acute in Northern, East and Western Cape supply areas preferred by developers for utility-scale wind projects. The situation is likely to persist until about 2027 (See future of grid).

Aggregators add new commercial dimension

The changes in regulation have also carved out a niche role for energy traders or aggregators, who are intermediaries that buy power from multiple IPPs for sale to various offtakers, including mining companies, industrial users, municipalities and even Eskom, in different geographical locations.

CASE STUDY

Blume Energy, Rise Energy Fund and the Abcon Group

Blume Energy is a South African renewable energy developer with a proven track record in delivering end-to-end energy solutions, from generation and storage to energy efficiency. Beyond cost savings and energy generation, Blume partners with clients to navigate the evolving energy landscape, simplifying the process so businesses can focus on their core operations. This seamless integration of expertise and execution ensures reliable, sustainable energy solutions tailored to client needs. Blume's seasoned team brings 60+ years of combined experience in the energy sector, having developed more than 350 MW of renewable projects in South Africa.

Rise Energy Fund is a leading financier of renewable energy projects focusing on solar generation, battery storage, and other renewable technologies. Rise Energy benefits from direct access to Blume Energy's development pipeline and provides clients with energy security and savings through Power Purchase Agreements (PPAs) and innovative contracting structures. Its fully integrated approach – combining development, fund and asset management, and EPC services with long-term capital – positions Rise as a leading IPP in the region.

Backed by the Abcon Group, a 40-year leader in property and investment management, both Blume Energy and Rise Energy Fund benefit from a legacy of integrated, partnership-driven growth. The Group's diversified portfolio across commercial property, private equity, listed equity, and renewable energy underscores its commitment to fostering sustainable, independent ventures that shape industries.

Aggregators use the transmission and distribution grid to wheel power from generation points to consumption sites, and by combining the demand of multiple customers into a single large volume, they can negotiate better tariffs and terms with IPPs.

In this model, the offtake risk is borne by the aggregator and not the generator. This has opened up wheeling opportunities to private companies looking for affordable clean energy and to expand their existing embedded generation. As the energy availability stabilises, the growing capacity of solar PV and other forms of renewable energy is expected to create further opportunities for the private sector in electricity trading and wheeling.

Aggregators have become an interesting cog of the commercial and industrial sector and will be an increasingly vital part of the energy transition as the market liberalises. They promise to provide users with reliable, cheaper energy, adding new capacity that supplement grid electricity. While the number of aggregators is difficult to ascertain, notable players in the space include Africa GreenCo, PowerX, Energy Exchange, and Etana Energy.

CASE STUDY

Private bank financing to support the expansion of a C&I portfolio

In November 2023, Nedbank CIB, with other institutional partners, closed a ZAR2.5bn ($132m) consolidated finance facility to assist Pele Green Energy (PGE) advance 1.1GW of renewable energy projects and build its project portfolio to 5GW by 2027. Nedbank's share of the facility was ZAR1bn.

The facility replaced PGE's previous capital-raising frameworks that operated on a project-by-project basis. The loan included a preference share clause allowing the lenders to benefit if PGE increases in value.

As with most of its energy transactions, Nedbank acted as the mandated lead arranger, underwriter and bookrunner.

The removal of the cap on the amount of energy IPPs can produce gave the developer an opportunity to move quickly to help alleviate pressure on the national grid. To make good on this opportunity, PGE needed a mezzanine and innovative funding solution to streamline the delivery of its project pipeline.

It turned to Nedbank CIB to structure the bespoke transaction.

It provided PGE with a capital base enabling it to deliver the Just Energy Transition as well as benefits from the cross-collaterisation of different technologies, including those for wind and solar generation and battery storage.

About 80% of the projects that PGE plans to develop are for the private sector, with the rest being developed through bids in government procurement programmes to supply the national grid. Flagship projects in PGE's growing portfolio include the 100MW Sonvanger Solar Power Plant and 100MW Pofu Solar Power Plant where PGE is the lead and sole shareholder as well as its 47% equity interests in the 75MW Grootspruit and 75 MW Graspan Solar Projects.

CASE STUDY

C&I power project supporting a mining company's transition to net zero

In February 2024, Envusa Energy – a joint venture between Anglo American and French renewable energy independent power producer EDF Renewables – reached financial close on the three Koruson II renewable energy projects totalling 520MW. Commercial operation of the plants is due in 2025 and 2026.

The plants are located in the Hydra supply area which overlaps with the south eastern part of Northern Cape province near the border with Eastern Cape and close to the Koruson 400kV main transmission substation to which they will all connect. Via this grid connection, the 140MW Umsobomvu and 140MW Hartebeesthoek wind farms, and the 240MW Mooi Plaats solar PV plant, will supply power to Anglo American mines, smelters, and refineries across South Africa.

Anglo subsidiaries Anglo American Platinum (Amplats), Kumba Iron Ore, and De Beers have signed 20-year offtake agreements with Envusa, under which Amplats will get 461MW of supply, Kumba's Northern Cape Kolomela mine 11MW and De Beers' Venetia mine in Limpopo 48MW.

The supply of sustainable renewable power to operations such as Amplats' platinum mines and smelters is a fundamental part of both South Africa's and the world's transition to net zero. Once platinum ore emerges from Anglo American's Limpopo mines and is milled, smelted, purified, and refined, it can be used as a catalyst in clean energy technologies, such as fuel cells and hydrogen electrolysers, and can play a key role in producing green hydrogen from renewable energy sources.

But for the element to play this vital role in the energy transition, and to find its place in the global market, it must also have been produced with as little impact on carbon emissions as possible.

Nedbank CIB led the structuring, negotiation and implementation of a multi-billion rand financing deal for the construction of the first phase of Envusa Energy's project. It was the co-mandated lead arranger, lender, hedge provider, coordinating bank, technical bank, insurance bank, facility agent and account bank for the deal.

The grid and the outlook for its development

Electricity market and grid reforms

South Africa's electricity supply market is being restructured in an exercise that started in 2019, and which reached a key turning point in July 2024. In that month National Transmission Company of South Africa (NTCSA) started officially trading as an independent and wholly owned subsidiary of state-owned utility Eskom Holdings SOC.

This reform was followed almost immediately by the signing of the Electricity Regulation Amendment (ERA) Act into law in August, giving impetus to the unbundling of Eskom into three separate entities for generation, transmission and distribution, creating a new, competitive electricity market. The reforms in the law broke down Eskom's traditional monopoly as the supplier of electricity, allowing the private sector to play a leading role in supplying new build renewable electricity and building transmission infrastructure.

Then in March 2025, Electricity and Energy minister Kgosientsho Ramokgopa gazetted a determination for independent transmission companies to build, own, and transfer pilot transmission lines to the National Transmission Company of South Africa (NCTSA).[1] This was followed in April by the release of draft transmission regulations, under the ERA Amendment Act, outlining how private investors can be involved in building the transmission network.

The changes had been a long time in coming. NTCSA was incorporated at end-2021. Its transmission license was approved by the National Energy Regulator of South Africa (Nersa) on 27 July 2023 while the import/export and trading licenses followed on 18 September 2023. The licence is for five years to allow the transition from exclusive trading and integration of any changes arising from price changes and the application of the ERA Act.

NTCSA will operate and manage the transmission grid, while acting as the system and market operator and international trader. The network comprises some 28,000km of high voltage power lines that transmit electricity to cities and towns and 325,000km of lower voltage lines that transmit electricity to homes and businesses.

Benefits of the transition

The division of Eskom's transmission division into a separately managed body will help resolve some of the main structural challenges confronting the South African power sector.

Becoming an entity in its own right will allow NCTSA to pursue an independent business model, separating it from some of Eskom's financial constraints. During the 2022/23 financial year, Eskom's gross debt peaked at ZAR424bn. The largest part of the utility's deficit is caused by the immense difficulties it faces in managing its fleet of coal-fired generation plants. These problems have reverberated through every other part of Eskom's activities, preventing it from funding other operations – such as the construction of new transmission.

The unbundling is expected to be an important step in establishing the conditions for a fully competitive electricity market, enabling much greater contributions from private players in the generation space. This is critical to enable diverse energy generating sources to contribute to South Africa's power mix.

But most importantly, the NTCSA's role will be to accelerate maintenance, refurbishment and expansion of the national grid infrastructure – a crucial precondition for the connection of more generation capacity – especially wind and solar projects. At present, network constraints in many parts of the country including Eastern, Western, and Northern Cape provinces mean that opportunities for adding clean, sustainable generation are limited.

It will further open up new possibilities for financing the construction of badly-needed transmission infrastructure.

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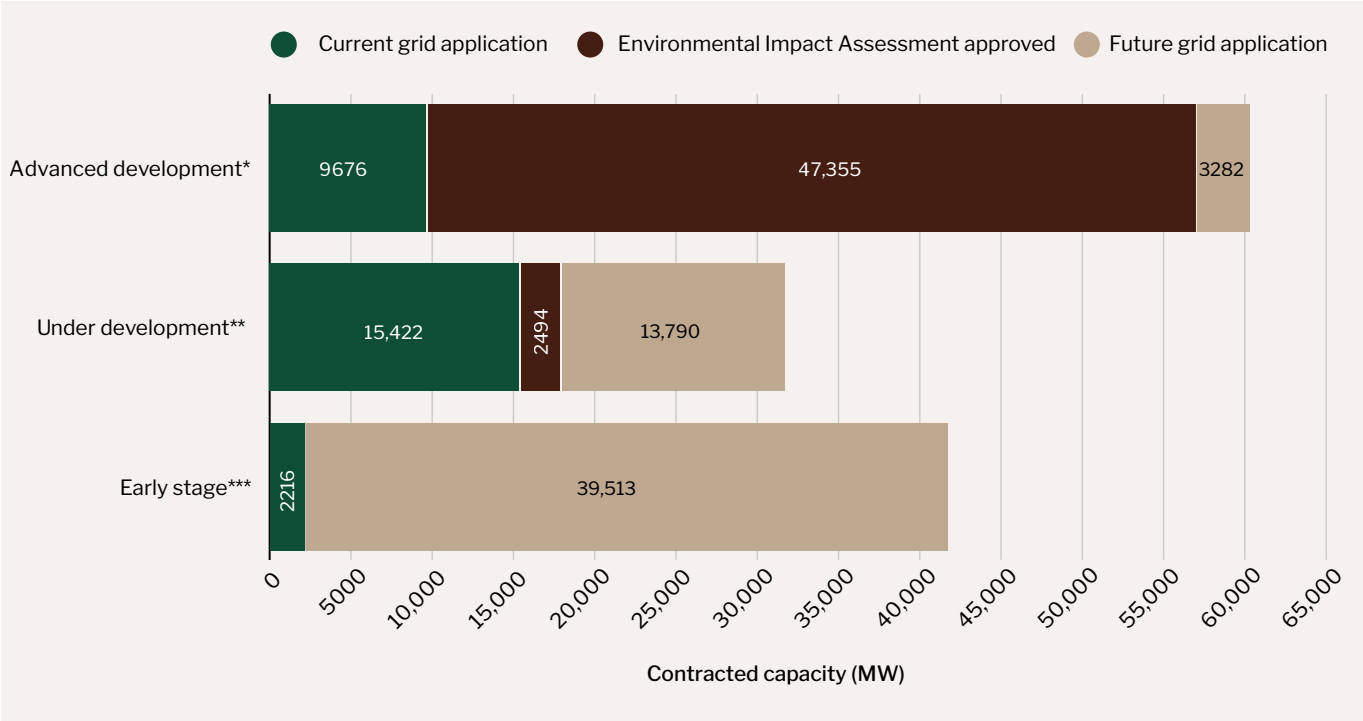
1 Unlocking Private Capital for Expanding & Modernising Transmission Infrastructure 4 April 2025: https://cdn.nowmedia.co.za/nowmedia/energize/landingpages/MOEE/MOEE%20Presentation-V2.1.pdf.

Potential RE contracted capacity

Assessed by project development stage and readiness



*Source: NTCSA 2024 Grid Survey. Notes: * 3 years to COD granted immediate grid connection; ** 3-5 years to COD if granted immediate grid connection ; *** Could reach COD in 5-7 years*

Grid constraints

Since 2007, South Africa has experienced rolling blackouts as demand for electricity has exceeded supply, with the worst impact felt in 2023. The emergency liberalisation of the sector has resulted in an explosion in the size of project pipeline. According to NTCSA's 2024 Grid Survey, the planned installed capacity of the whole renewable energy pipeline in 2022 was 63GW. It grew to 93GW in 2023 and reached over 172GW in 2024. This is equivalent to nearly tripling in the space of two years.

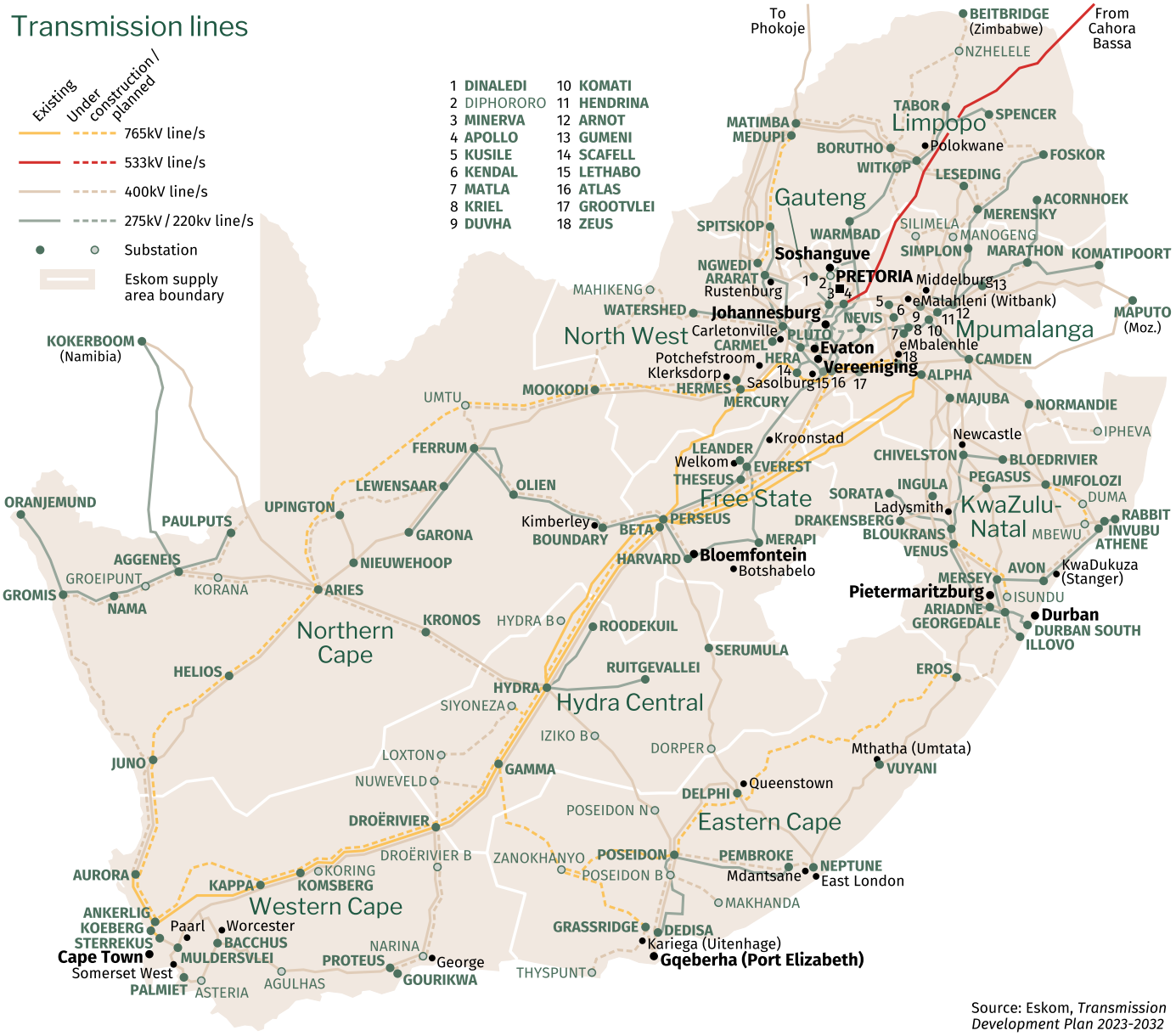
The survey estimates that NTCSA would need to contract about 134GW of grid connection to meet the requirements of this pipeline capacity. It indicated that about 45% of this capacity is at an advanced stage of development, meaning that if granted an immediate grid connection it could be commissioned within three years.

The supply areas where the most grid connection capacity is needed are Northern Cape (29.2GW), Free State (20.6 GW) and Hydra Central (18.7GW). According to Eskom's 2025 Generation Connection Capacity Assessment (GCCA) published in October 2023, there was no grid capacity available in either Northern Cape or Hydra Central, nor in the Eastern and Western Cape areas with pipelines of 8.9GW and 7.6GW respectively. Free State had 1.4GW of available connection capacity. The largest amounts of grid capacity were available in KwaZulu Natal – the only supply area where the pipeline was less than available grid connection – and in Gauteng and Mpumalanga (See map).

But while the totality of potential grid connection requests is huge, the number of projects at a stage when they could viably be connected to the grid within a three-year time frame, and which have also applied for a connection is more manageable. Just 7% of advanced projects – requiring 9.7GW of contracted grid capacity – have a current grid application. A second group of projects which could be operational in three to five years have also requested connections. They require a further 15.4GW of connection capacity.

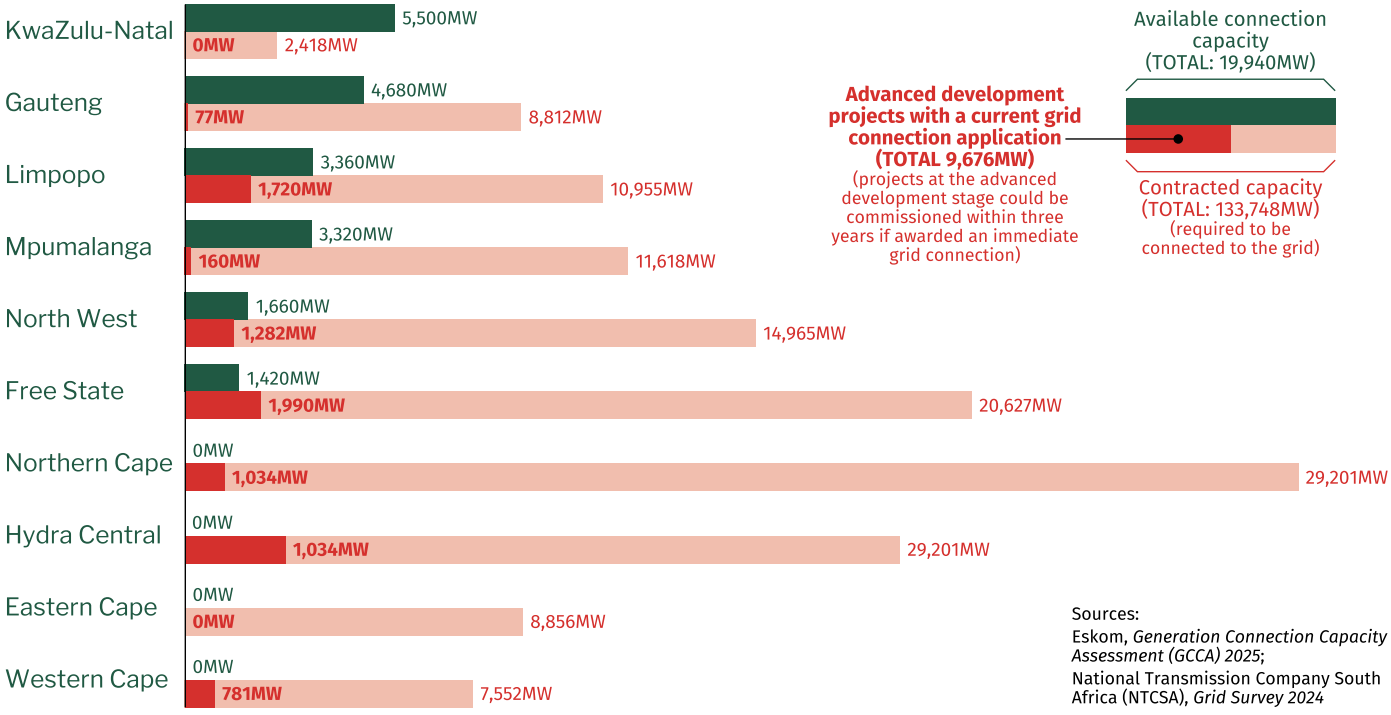
This means that in most of the supply areas where grid capacity for 2025 was available according to Eskom's end 2023 assessment, the relevant projects can probably advance. With grid expansions progressing, the question is how quickly will development of generation projects outstrip NTCSA's ability to provide new connection capacity.

Transmission lines



Source: Eskom, *Transmission Development Plan 2023-2032*

Connection capacity



Sources:
Eskom, *Generation Connection Capacity Assessment (GCCA) 2025*;
National Transmission Company South Africa (NTCSA), *Grid Survey 2024*

CASE STUDY

Construction of wind farm cluster in Eastern Cape for industrial offtake

In late February 2024, Enel Green Power South Africa (EGP South Africa) and its operating subsidiary Impofu Cluster Investment SPV (RF) (Pty) Ltd, reached financial close on a cluster of three 110MW wind plants at Impofu in Eastern Cape province.

The wind farms: Impofu East, Impofu West, and Impofu North will provide renewable electricity to Air Liquide Large Industries South Africa (Air Liquide) and Sasol South Africa (Sasol)'s facilities in Secunda via a wheeling agreement with Eskom. Air Liquide operates the world's largest oxygen production facilities in Secunda, with 17 air separation units. In January 2023, EGP South Africa signed two long term power purchase agreements (PPA) with the two companies to supply a total capacity of 220 MW of renewable energy. The partners signed a third 110MW PPA in February 2024, taking the full amount to 330MW.

Sasol plans to secure 1,200MW of renewable energy capacity from IPPs by 2030. Nedbank CIB was the co-lender, arranger, facility agent, account bank, and hedge provider of the finance facility for the projects. It provided a ZAR11.3bn ($620.3m) finance facility.

Future grid expansion

Despite its precarious financial position, Eskom has been using a mix of debt and its own cash to finance transmission infrastructure projects to unlock more this badly needed grid capacity.

When Eskom transferred its transmission assets in July 2024, it signed an equity subscription agreement with NTCSA. At the same time, the government put in place ZAR3.8bn of relief with Eskom to cover the portion of the utility's debt linked to these assets.

In the 2024 Transmission Development Plan (TDP), the NTCSA said it required ZAR112bn to fund its projects in the first five years of the plan. A budget is in place to cover this. More capital will be required to fund the subsequent five-year plan and NTCSA's capacity is limited by its balance sheet and revenue. It is also not yet able to raise its own debt.

The start of operations at NTCSA is hoped to accelerate this process. Already prior to the formal launch of NTCSA, Eskom had initiated 46 transmission projects, of which an initial batch of 26 will deliver 1,632km of transmission lines, 11,290 megavolt ampere (MVA) of transformer capacity and facilitate over 15GW of new capacity connections to the grid by 2028.

Construction has started on half of this initial batch. These projects should enable more than 10GW of generation to be added to the grid. The remaining 13 projects are in different stages of procurement, covering 435km of lines with 8,000MVA of capacity and enabling a further 4,975MW to be connected to the grid, mainly in Northern Cape and Western Cape. A further 25 projects have been identified to add transformers at existing substations that could unlock 13GW of new generation in the next five years, and 22 other transmission projects to unlock 24GW by 2033.

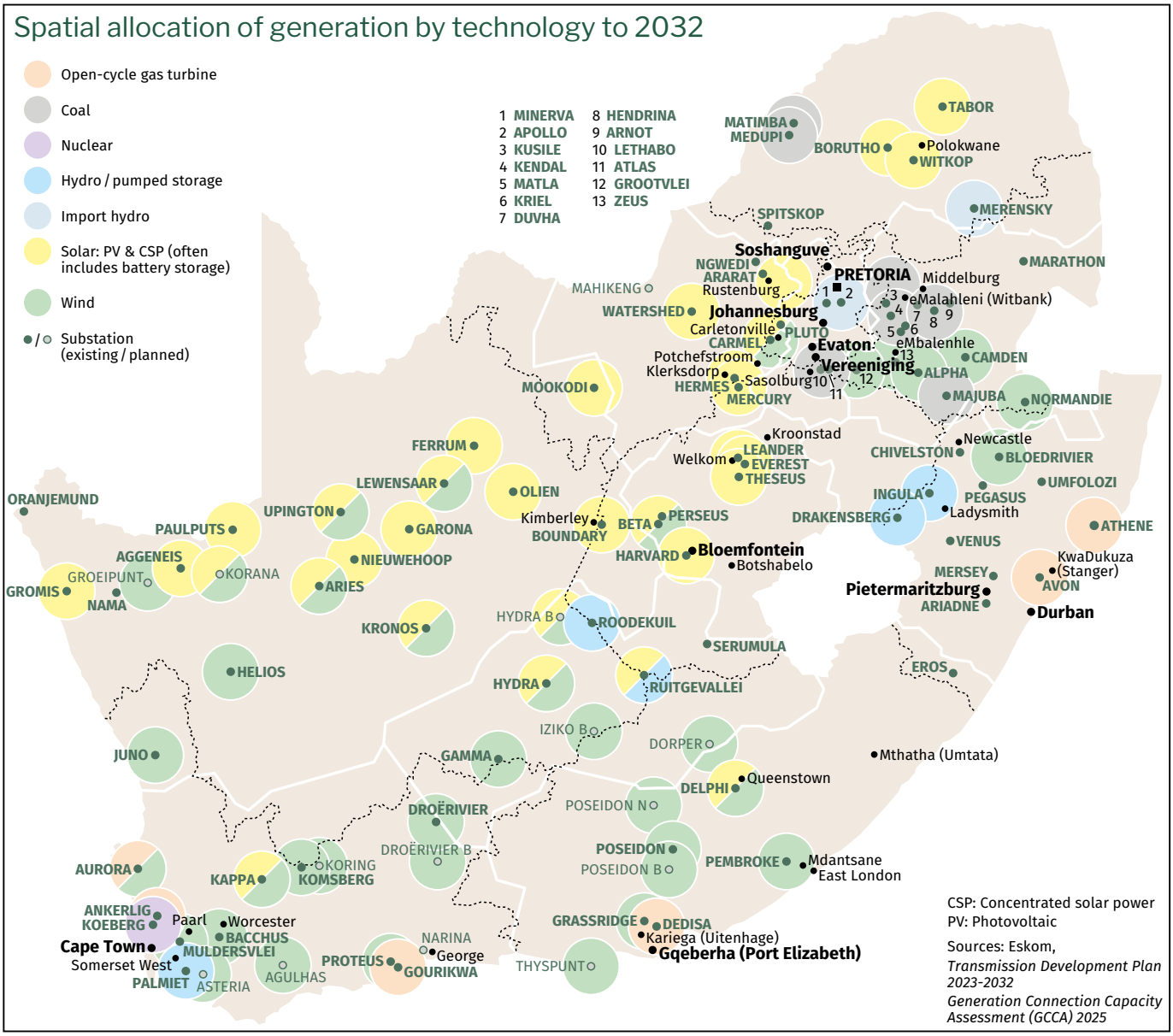
Grid financing requirements

The first 26 projects in this wider transmission procurement plan will deliver a little over one-tenth of the additional high voltage power lines that South Africa needs. According to Eskom's 2022 Transmission Development Plan (TDP), to unlock new grid capacity it needs around 14,218km of additional extra-high-voltage lines and 170 transformers to bring around 106,000MVA of transformer capacity online over the next ten years.

Over ZAR390bn will be required over the next decade to fund grid expansion to accommodate new generation capacity from renewable energy projects. Eskom had a ZAR254bn ($14bn) debt relief package, approved by the government in April 2023, which prevented the utility from borrowing further during the three-year relief period (2024-2026), severely limiting its ability to attract investments.

With the delivery of transmission infrastructure taking, on average, between seven to 10 years, it is estimated that the delivery rate needs to be scaled-up by eight times to connect the energy generation required for energy security by 2030. The transmission grid build rate would also need to increase from 300km to 2,300km per year with a greater rate of investment and delivery required through to 2050.

Spatial allocation of generation by technology to 2032



CSP: Concentrated solar power
PV: Photovoltaic

Sources: Eskom,
Transmission Development Plan 2023-2032
Generation Connection Capacity Assessment (GCCA) 2025

In delivering these objectives, South Africa will be following the same path and so also competing for resources with every major economy in the world. The US Department of Energy's National Transmission Planning Study,[2] published in October 2024, found that a expansion of the US transmission system to 2.4-3.5 of its size in 2020 would deliver the largest benefits across a wide variety of its potential development scenarios.

Similarly, in its December 2024 monitoring report, the European Union Agency for the Cooperation of Energy Regulators (Acer) said "annual grid investment in Europe is estimated to double until 2050, reaching up to EUR 100 billion".[3] The UK's National Energy System Operator (NESO) said in 2024 that network expansion needs to happen at more than four times the rate of the last decade.[4]

A role for private finance

Consequently, bringing in some form of private sector participation may be the only way to make available the necessary finance and project delivery capacity. The government has said it is working on financing solutions which will tap into private sector funding to unlock new generation projects and alleviate power shortages, while ensuring that Eskom retains ownership of the grid. The solutions include the establishment of an independent transmission project office, which will be responsible for accelerating grid investment through private finance, contractors, and operators.

Public-private partnerships funding models could be used to expand and strengthen the electricity grid at speed and scale. Studies done on private sector transmission models suggests that the conventional state procured independent power transmission (IPT) and independent power producer (IPP) models could both be adopted to expand the grid. The authorities are also exploring funding possibilities through its Just Energy Transition Investment Plan.

In December, the government launched the ITP market sounding exercise, as a precursor to the launch of the ITP pilot tender planned in 2025. The government recognises that both public and private capital are essential to achieve its infrastructure investment goals. It has identified the ITP programme as a solution to unlocking private investment capital in transmission, given its constrained fiscal position and NTCSA's limited balance sheet.

The first ITP projects phase aims to expand the grid by 14,000km by 2032, starting with the construction of 1,164 km of new 400kV transmission lines and 2,630 MVA transformers in seven key corridors across three provinces. The projects located in Aries-Aggeneis, Groeipunt (Northern Cape), Mahikeng (North West), and the West Rand (Gauteng) are expected to unlock 3,222MW of renewable energy capacity by 2030.

The draft regulations set out licensing conditions, including requirements for technical and financial capability and mechanisms for building and operating infrastructure. The regulations also specify how investors should recover their full costs. Tolling mechanisms will facilitate cost recovery through wheeling charges or long-term user agreements.

The private sector will finance and operate the network, with the NTCSA responsible for grid planning, system operations, and reliability management.

The ITP framework has been shaped by a market-sounding exercise launched in December 2024 to gather alternative models for transmission infrastructure development, potential delivery mechanisms, and private sector interest and readiness. Results of the exercise have shown that many of the local and international respondents are interested in participating in the ITP and prefer the built, operate and transfer (BOT) model or built-own-operate-transfer (BOOT). The framework draws on best international practices in China, Brazil, Chile, India, Peru, and Europe.

In the next stages of the ITP procurement, a request for qualification is expected to be released to the market in July followed by a request for proposals (RFP) in November, marking the official introduction of the tender process for the first ITP projects.

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2 National Transmission Planning Study, US Department of Energy: www.energy.gov/sites/default/files/2024-10/NationalTransmissionPlanningStudy-ExecutiveSummary.pdf

3 Electricity Infrastructure Development to Support a Competitive and Sustainable Energy System, European Union Agency for the Cooperation of Energy Regulators (Acer) 2024 Monitoring Report, 16 December 2024: www.acer.europa.eu/sites/default/files/documents/Publications/ACER_2024_Monitoring_Electricity_Infrastructure.pdf

4 Electricity transmission infrastructure: what's changed. Ofgem, 13 December 2024: www.ofgem.gov.uk/blog/electricity-transmission-infrastructure-whats-changed

The Electricity Regulation Amendment Act

Landmark electricity law opens South Africa's electricity industry to competition

- The Electricity Regulation Amendment Act's introduction on 1 January 2025 marked a transformative change in the South African electricity supply industry.
- The transition will be fully achieved by completing Eskom's unbundling into three separate companies for generation, transmission and distribution.
- The ERA fosters competition with the creation of an independent transmission system operator, which will act as a transmitter, system operator, market operator and central purchasing agency.
- The new system is expected to create new opportunities, especially for the private sector.
- The National Energy Regulator of South Africa (Nersa) will have an enhanced role in overseeing the market and arbitrating in disputes.
- Some questions remain about the funding of NTCSA's vital Transmission Development Plan.

The Electricity Regulation Amendment Act's introduction marks a transformative opportunity to overcome South Africa's power supply crisis, delivering reforms that have been on the drawing board for nearly three decades, which are now opening the way for a more competitive, effective electricity supply industry.

The introduction of the Electricity Regulation Amendment (ERA) Act on 1 January, marked a transformative change in South Africa's electricity supply industry (ESI).

Signed into law by President Cyril Ramaphosa in August 2024, the Act heralded the beginning of a liberalised and competitive market, in which multiple electricity producers can compete on an equal footing with the former state monopoly, Eskom.

This liberalisation comes nearly three decades after the creation of a more competitive ESI was first seriously proposed with the December 1998 White Paper on the Energy Policy of the Republic of South Africa. This reform was to start with the unbundling of state-owned utility Eskom, breaking up its vertically-integrated generation, transmission and distribution arms.

That process is now, finally, fully under way, with the promise that a reformed ESI can lead South Africa out of years of electricity supply problems, in the process energising accelerated economic growth.

While Eskom has historically dominated the generation and T&D, its poor performance, limited competition and insufficient investment have led to serious efficiency and reliability problems. Load-shedding was first recorded in 2007; it peaked at a debilitating 6,760 hours in 2023. Up until the law's enactment, Eskom boards and chief executives had come and gone, while financial rescue plans had signally failed to solve the deep-seated ESI crisis.

By opening the market to competition, the authorities are banking on reforms that will improve power supply and end load-shedding, while bringing down electricity prices and closing South Africa's enormous infrastructure gap.

While most provisions of the ERA became effective on 1 January 2025, amended definitions of "reticulation" and "distribution power systems" will be brought in later. The South Africa Local Government Association (Salga) and metropolitan municipalities have argued that the initial definitions were unconstitutional and undermined their authority to trade and distribute electricity.

Transmission among ERA's key provisions

The transition will be fully achieved by completing Eskom's unbundling into three separate companies for generation, transmission, and distribution. Their separation brings an end to Eskom's monopoly of the national grid and should allow more players to sell power directly into the national grid.

To foster competition, ERA introduces an independent transmission system operator (TSO) that will act as a transmitter, system operator, market operator and as central purchasing agency (CPA).

The independent TSO will be established within five years and will oversee electricity transmission. In the interim, National Transmission Company of South Africa (NTCSA), a distinct but wholly-owned subsidiary of Eskom, will act as TSO.

In a significant milestone for the ESI, that followed a prolonged unbundling exercise, NTCSA started trading on 1 July 2024. The National Energy Regulator of South Africa (Nersa) has licensed NTCSA to operate and manage the transmission grid, buy energy from Eskom generators and independent power producers (IPPs), and import and export energy.

However, the transmission network will continue to be owned by the state, with many private companies competing to provide services. Plans are afoot to establish other Eskom subsidiaries, including a National Energy Distribution Company South Africa (NEDCSA) and a new Eskom holding company.

Nersa's role is sharpened

Nersa will remain the ESI regulator, and is being endowed with additional powers to facilitate a smooth market transition. These extend to Nersa acting as an arbitrator between stakeholders.

Nersa will set and approve tariffs based on supply agreements, ensuring licensees recover their costs.

...in reforms that will aid the transition to clean energy

The ERA reforms are expected to enhance South Africa's capacity to transition towards a cleaner and more modern energy system by reducing reliance on coal-fired power.

Eskom operates 15 coal-fired power stations with an installed capacity of 45.3GW. These facilities supply about 90% of South Africa's electric power. According to current schedules for winding down this coal dependency and modernising the generation mix, approximately 12GW of Eskom's coal plant capacity will have collectively been decommissioned by 2035.

The new system is expected to create new opportunities, notably for the private sector, which the reforms intend to place at the forefront of the energy transition.

This will boost the growth of renewable energy (RE) technologies such as solar, wind and battery power, and increase RE's share of the energy mix. At present, an estimated 6.4GW of on-grid renewable capacity is in operation.

The removal of a 'single buyer model' dominated by Eskom will allow IPPs to sell power directly to multiple private offtakers, traders, and potential regional and cross-border markets at market-driven rates.

A significant increase in the regional market is already envisaged by Africa's most dynamic cross-border electricity trade, the Southern African Power Pool (SAPP) – whose 12 government members are being joined by an increasing number of private companies.

The change will help reduce IPPs' reliance on Eskom and create opportunities for private investors to diversify their revenue streams through dynamic contracting structures such as merchant power purchase agreements (MPPAs).

The introduction of merchant markets is further expected to attract investment into RE projects, encouraging faster development of the ESI and promoting security of supply.

Another notable highlight of ERA is the introduction of electricity traders and aggregators as a new and important group of market participants, promoting competition. Electricity traders, who are able to buy power from IPPs for sale to multiple offtakers, have already become an important element of the energy transition, wheeling power to customers, providing cheaper, reliable energy – in the process adding vital new capacity to the national grid.

Nersa has to date issued nine electricity trading licenses and will continue to process new applications. This is despite objections from Eskom, which has threatened to approach the courts to stop Nersa from granting licences to private traders in areas where its distribution entity already holds a licence; the utility argues that Nersa's current rules prohibit two or more licensees supplying the same area.

The newly liberalised ESI is also expected to largely encourage more investment in transmission infrastructure, through partnerships with the private sector. Grid constraints in resource-rich areas of Northern Cape, Eastern Cape and Western Cape are limiting the connection of vital RE to the grid.

Notably, new wind generation bids have been set aside for both the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)'s six and seventh bid rounds. Against this backdrop, it becomes extremely urgent to expand and modernise grid infrastructure to accommodate new generation capacity.

According to NTCSA's 2024 Transmission Development Plan, ZAR112bn ($6bn) is required to fund the construction of 14,494km of transmission lines and 210 transformers during the TDP's first five-year horizon. An adequate capital budget has been secured for the plan's first five years, but most of the capital spend is in the later five-year period, when NTCSA's capital plan is limited by its balance sheet and allowable revenue stream.

While NTCSA thinks it can build the infrastructure in the TDP's first five years, it needs help to deliver beyond then. TDP 2024 expects generating capacity to increase from 66GW to 107GW a decade later, in 2034. This would be accompanied by a substantial change in the technology mix, with the increased generation mainly be driven by wind, gas, rooftop solar photovoltaic and utility solar PV capacity.

For the reforms to be successful, ESI players emphasise that the Eskom unbundling must duly be completed – as it is integral to the success of an open, transparent and equitable grid, which is finally accessible to all market participants.

Energy tracker

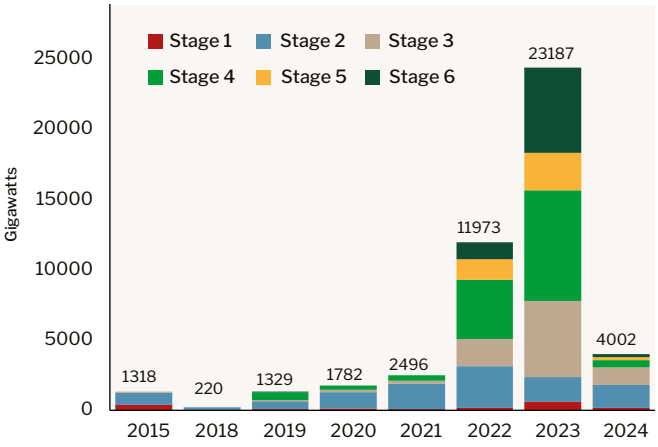
April 2025

KEY TAKEAWAYS

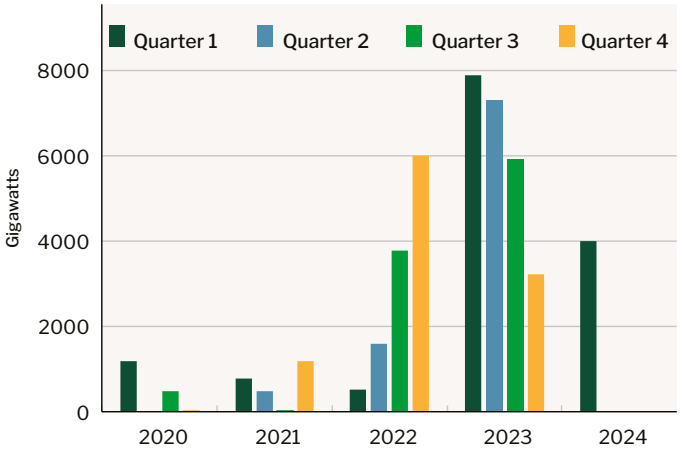
- Electricity supply improved in 2024, with reduced load-shedding (LS) in Q1 and no LS for the rest of the year.
- The causes are weaker demand for energy combined with improved generative capacity from returning units to the grid and ramping up planned maintenance.
- Electricity supply is still vulnerable, despite the improvement in Eskom's EAF.
- Generation capacity is still constrained. A more dramatic shift towards renewable energy (RE) is required to reduce the pressure on the national grid.
- Ongoing energy insecurity is evident in the reliance on the compensatory load, still significant levels of unplanned outages and the return of LS in Q12025
- Expediting progress on the plethora of energy plans is required to bring about energy security.

There has been less load-shedding so far in 2024 relative to 2023 and 2022

4002 GW were shed from the grid in 2024 versus 23187 GW in 2023



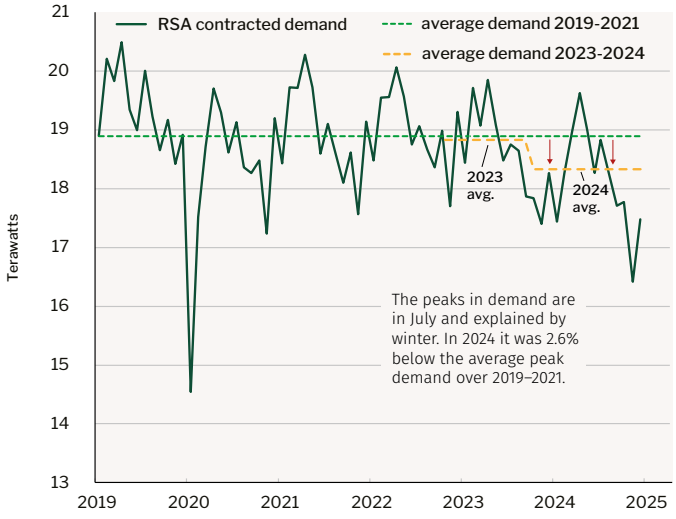
The last day of LS was 25-March 2024



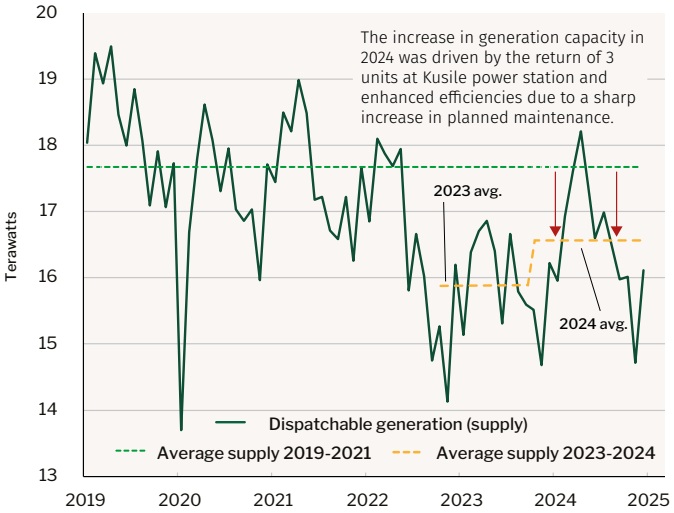
Source: EskomSePush & Nedbank calculations

Improvements were driven by falling energy demand and an uptick in supply

Demand fell below its 2019-2021 average and has remained there



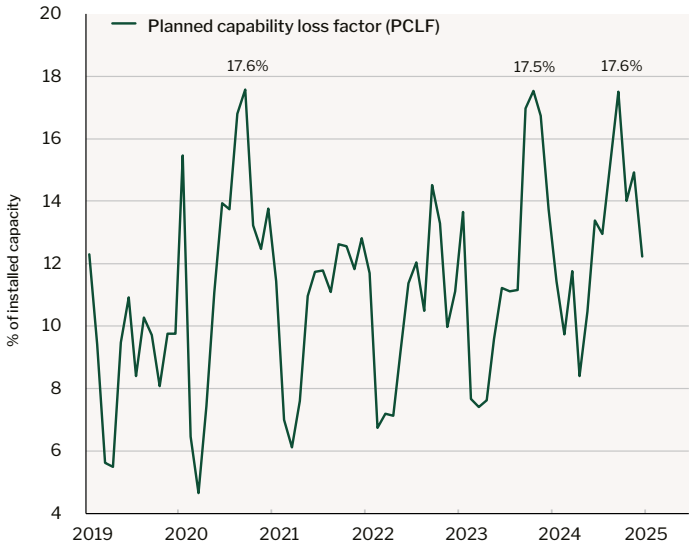
Dispatchable generation increased above its 2023 levels but is still weak compared to 2019-2021



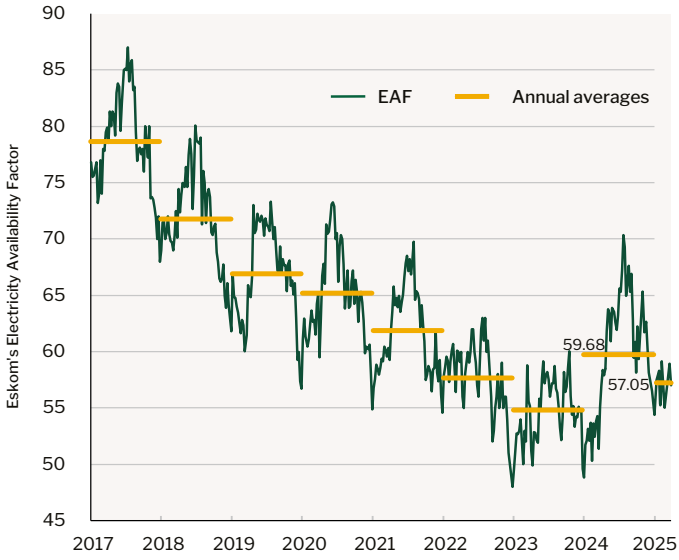
Source: Eskom & Nedbank calculations

Falling demand has facilitated an increase in planned maintenance and an improvement in the electricity availability factor (EAF)

The PCLF peaked at 17.6% in Dec-2024 the highest since Dec-2020



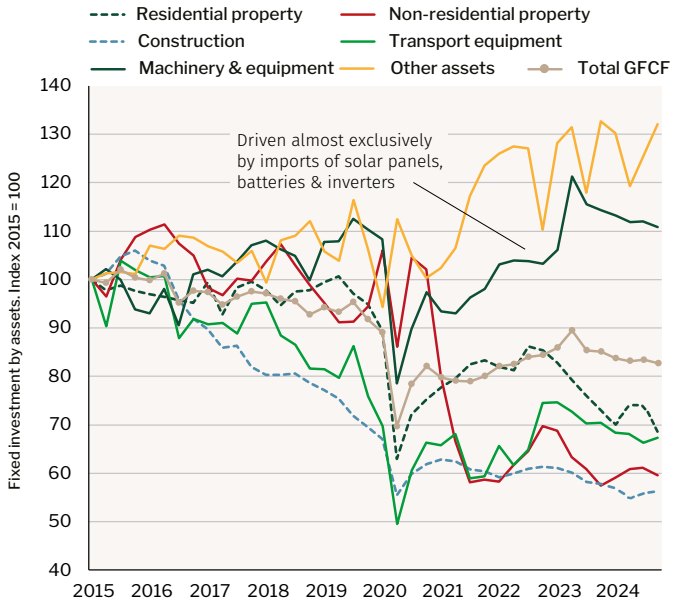
Which, arguably improved generative efficiency, Eskom's EAF jumped to 60% in 2024



Source: Eskom & Nedbank calculations

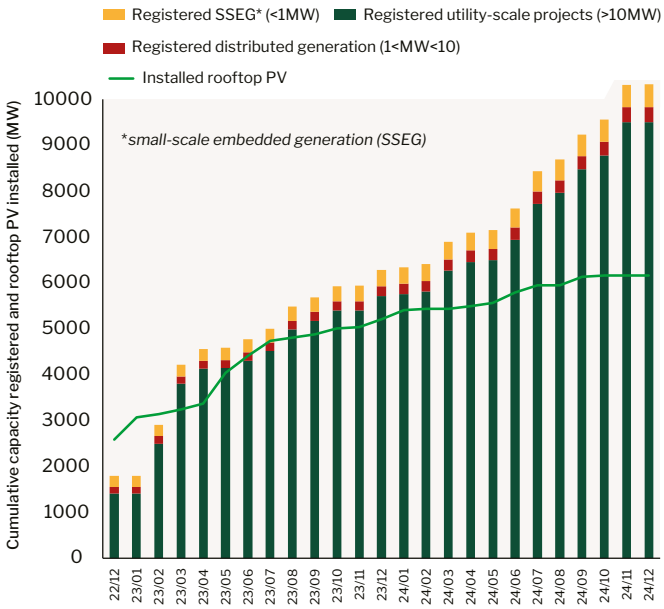
The shift to solar by households and businesses in response to the power crisis has led to the drop in energy demand

Fixed investment into machinery and equipment (including solar panels, batteries and inverters) in 2023 reflects the shift to RE



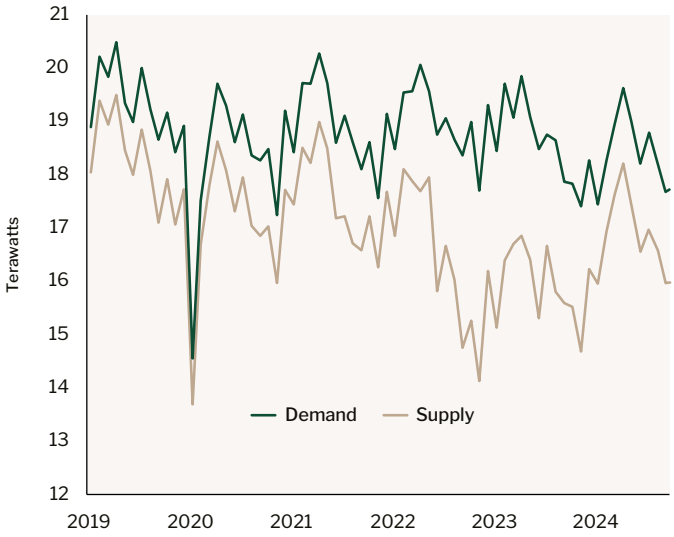
Source: Stats SA & National Treasury

SSEG registrations have increased by 474% and solar PV installations by 138% between Dec-22 and Dec-24

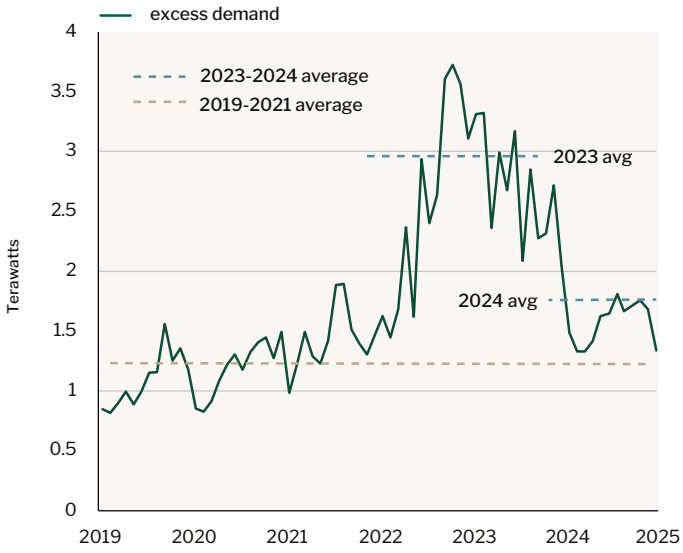


Despite the progress made, excess demand over supply remains a pressing concern

Demand remains greater than supply…



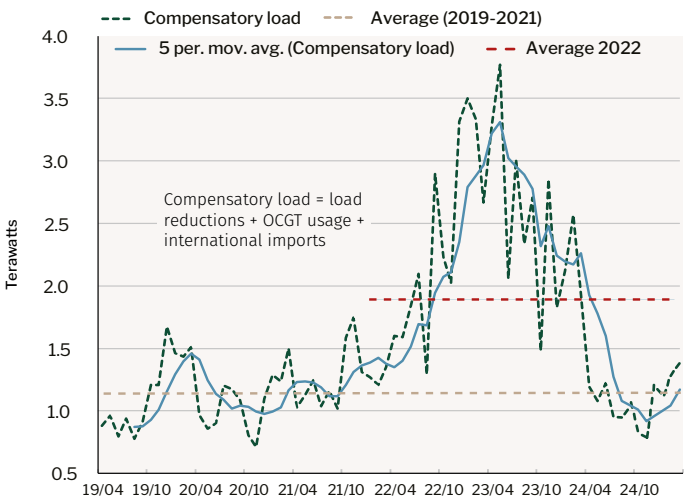
…with excess demand above its 2019–2021 average



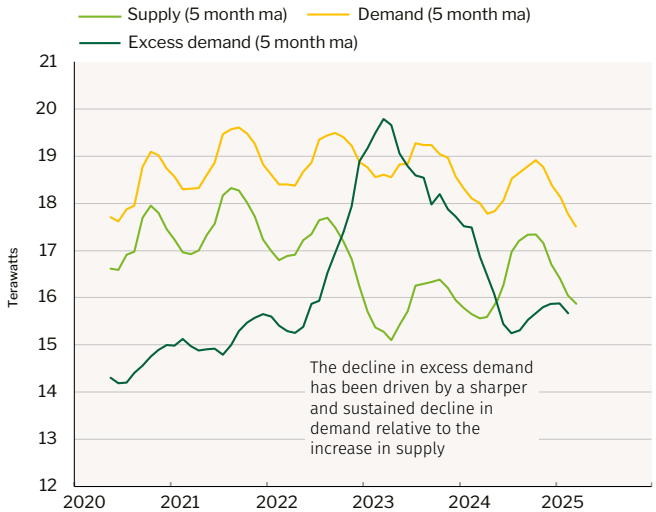
Source: Eskom & Nedbank calculations

Excess demand is compensated for by load reductions + increased imports + open-cycle gas turbines

There has been a decline in the compensatory load, driven by the reduction in excess demand



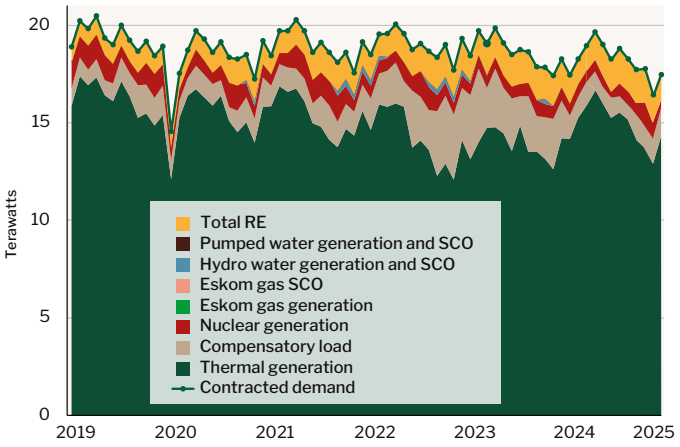
The more sustained decline in the compensatory load has been fuelled by the decline in excess demand over supply



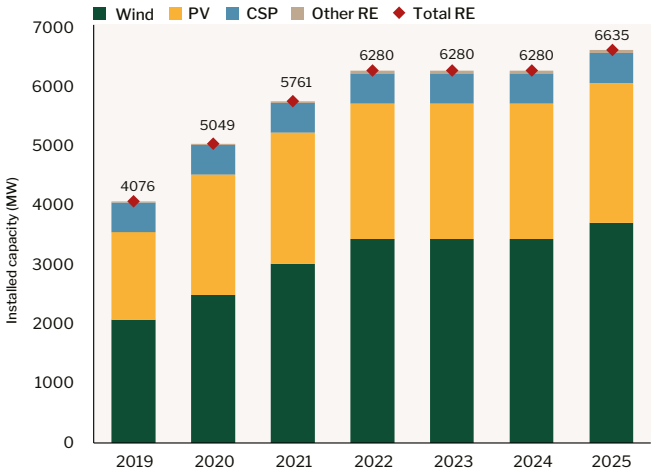
Source: Eskom & Nedbank calculations

The achievement of stable electricity supply requires a sustained improvement in generative capacity and less dependence on the compensatory load

80% of Eskom's supply is from old coal-fired powered stations



New installations of RE stalled in 2024 before increasing at the start of 2025



Source: Eskom & Nedbank calculations

Relying on aged energy infrastructure is disconcerting: The Opera Assessment Report underscores the need for comprehensive reforms and upgrades to Eskom's infrastructure

The report highlights the following issues at Eskom:

1. Deteriorating plant conditions – The report highlights that many of Eskom's coal-fired power plants are in poor condition due to years of inadequate maintenance and operational practices. Specific issues include the poor state of water treatment plants at Medupi, Matimba, and Kendal, which, if not addressed, could result in significant power outages.

2. Low Energy Availability Factor – When writing the report, Eskom's coal fleet had an EAF of around 51%, well below the international benchmark of 78%. An indication that Eskom's infrastructure is not operating efficiently due to mismanagement and sub-standard maintenance practices.

3. Risk of severe load-shedding – The report warns that if Eskom does not improve its infrastructure, the country could face load-shedding levels as high as stage 13 due to the potential loss of 13 000 megawatts of generation capacity from critical power stations like Matimba, Kendal, and Medupi.

The report makes the following recommendations:

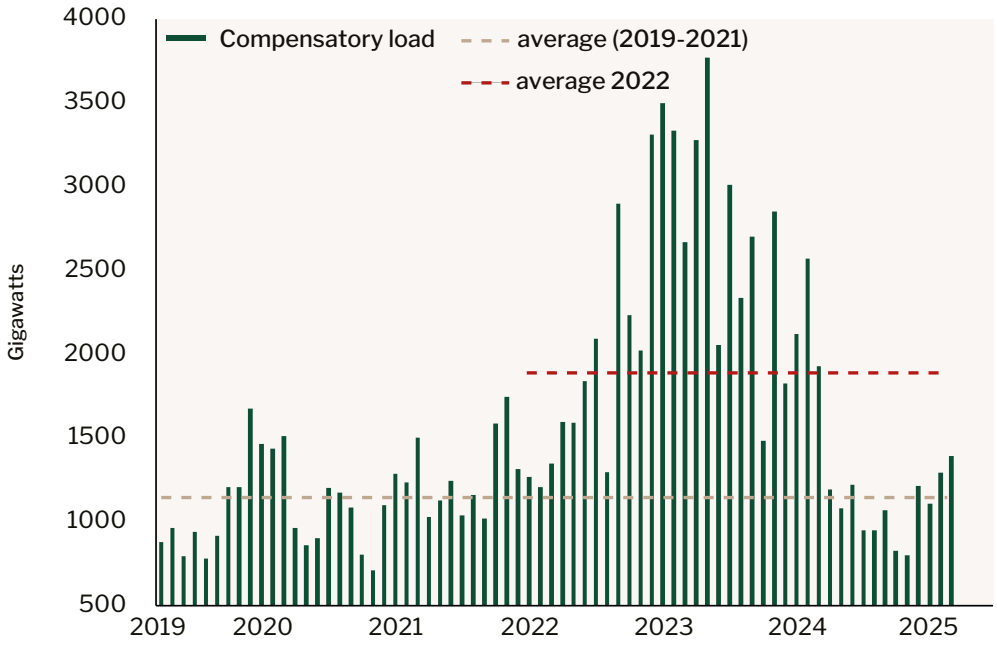
1. Need for an infrastructure overhaul – A complete overhaul of Eskom's centralised organisational structure to improve decision-making and operational efficiency. It recommends adopting a model like European utilities, which involves decentralising operations and granting more authority to plant managers.

2. Emergency maintenance and upgrades – Urgent maintenance and upgrades are needed for critical components, such as water treatment plants and flue gas stacks, to prevent large-scale power outages. The report suggests that bringing in private contractors with expertise in running similar plants could significantly improve the performance of Eskom's infrastructure.

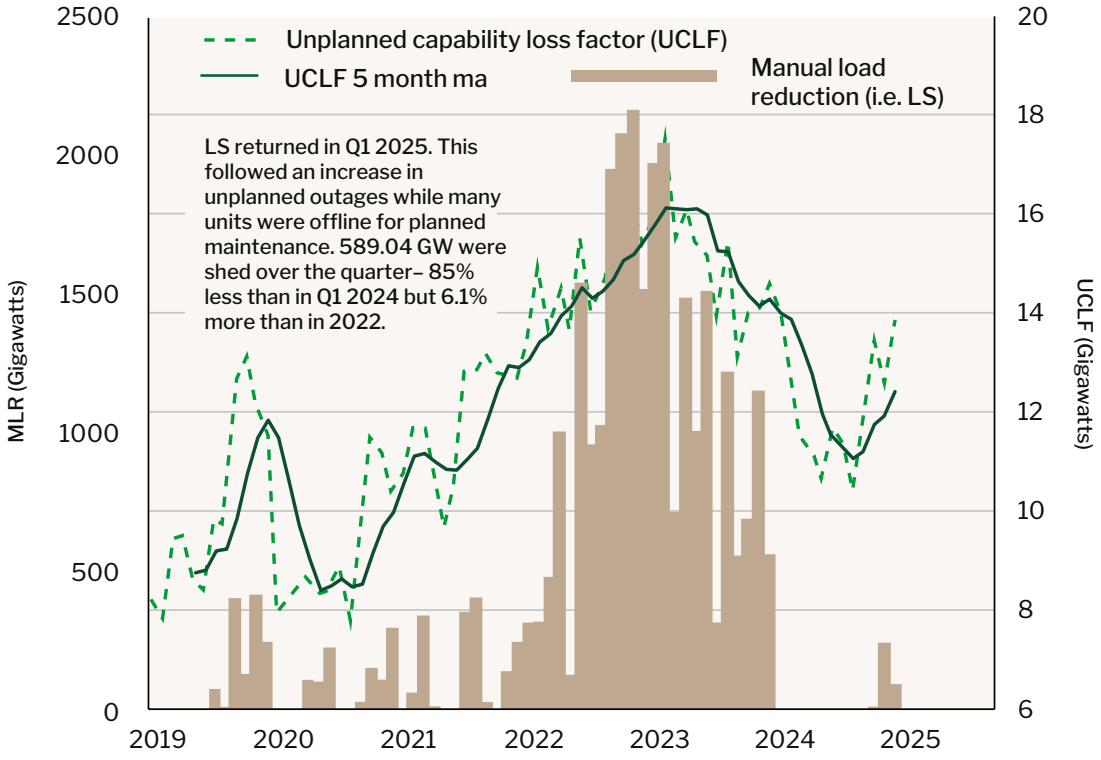
3. Addressing design issues – The report acknowledges that while some design issues contribute to the poor performance of plants like Medupi and Kusile, the primary problem lies in Eskom's deviation from prudent operation and maintenance practices. It suggests that addressing these design and operational flaws is crucial for improving plant availability and efficiency.

Energy security thus remains compromised

Reliance on the compensatory load is evidence thereof



So are extraordinarily high levels of unplanned outages and the reality of load-shedding



Source: Eskom & Nedbank calculations

There are multiple plans and programmes in place to address the power crisis although traction is needed in expediting them

Plans in place to address the electricity crisis include:

1. The Integrated Resource Plan (IRP):

- The IRP could be considered the overarching blueprint of the country's energy objectives. The 2023 revision outlines the country's electricity generation plan up to 2050. It emphasises a diversified energy mix to ensure security of supply, reduce emissions, and promote economic growth.
- The plan acknowledges the need for a balanced approach that includes renewable energy sources like coal, nuclear, and gas. It also highlights the importance of energy efficiency and demand-side management.

**The IRP is under review following public commentary and is yet to be finalised.*

2. Renewable Energy Independent Power Producer Procurement Programme (REIPPP)

It is a government initiative that aims to increase electricity capacity through private sector investment in renewable energy projects. It is a competitive bidding process, where independent power producers (IPPs) submit proposals for renewable energy projects. The government selects the most competitive proposals and awards them contracts to supply electricity to the national grid.

3. Risk Mitigation Independent Power Producer Procurement Programme (RMIPPP)

This is a programme designed by the government to address the country's short-term electricity supply constraints. It procures new generation capacity from various energy technologies to reduce reliance on expensive diesel generators. Unlike REIPPP, which focuses on renewables, RMIPPP considers various sources of energy, including renewables, gas and coal. Its primary objective is quickly adding new capacity to the grid and reducing reliance on expensive peaking plants.

4. The Energy Action Plan (EAP)

A comprehensive strategy to address the country's energy crisis and achieve long-term energy security. It aims to:

- Increase electricity supply through various means, including renewable energy sources,
- Reduce reliance on Eskom, by enabling private sector investment in generation capacity, and
- Encourage energy efficiency among businesses and households.

5. Transmission Development Plan (TDP)

This plan outlines a 10-year roadmap for expanding the transmission grid. It envisions adding roughly eight 400 km of high-voltage lines and 119 transformers to the network by 2031. The expansion aims to accommodate a surge in renewable energy sources like wind and solar, often far from existing grid infrastructure. The plan prioritises fast-tracking grid connection projects to expedite the integration of new generation capacity.

6. Just Energy Transition Investment Plan (JET IP)

The plan outlines a 5-year roadmap (2023-2027) to achieve a low-carbon economy while ensuring a smooth transition for workers and communities reliant on fossil fuels. It focuses on:

- Decarbonisation: shifting away from coal-fired power plants to cleaner energy sources.
- Economic development: creating new job opportunities in the green energy sector.
- Social justice: supporting communities affected by the transition, including coal mine workers.

The JET IP is a collaborative effort between SA and international partners who have pledged financial support.

CONCLUSION

- The demand for energy has fallen, while the supply has increased. Nonetheless, excess demand remains high compensated for through load reductions, OCGT usage and international imports.
- Despite the yoy improvements in the EAF and load-shedding, energy supply is still insecure given the poor state of infrastructure.
- The crisis has spurred the establishment of multiple plans and programs. Implementation of these plans are underway, however at a slow pace.

Key contacts

Client coverage

Thiago Almeida

Divisional Executive Client Coverage Energy & Infrastructure | ThiagoA@nedbank.co.za

Ephraim Sehloho

Senior Banker Energy | Ephraimse@nedbank.co.za

Investment banking

Peter Van Kerckhoven

Co-head Debt Finance | PeterVK@Nedbank.co.za

Amith Singh

Head Energy Finance | AmithS@Nedbank.co.za

Mike Peo

Head Infrastructure, Energy & Telcos | MPeo@nedbank.co.za

Transactional banking

Rajshree Mistry

Regional Head TS Sales | RajshreeM@Nedbank.co.za

Hoosein Chothia

Principle | HooseinC@Nedbank.co.za

Markets

Sne Mnguni

Head Structured Sales | Snem@nedbank.co.za

Mak Etsane

Structured Sales Specialist | MakE@Nedbank.co.za

Chantal Flynn

Structured Sales Specialist | ChantalF@nedbank.co.za

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