



The Uplifting Africa Program

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South Africa's Energy Crisis



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The Energy Crisis in South Africa



Widespread national electricity blackouts are caused by the South African energy crisis, often known as load-shedding. This started in the latter months of 2007 and is ongoing. These rolling blackouts are blamed on insufficient generation capacity by some legislators as well as Eskom, the government-owned national utility and main electricity generator in South Africa.

Eskom and government representatives claim that building more power plants and generators is a necessary step towards a solution. Eskom's corruption and poor management, particularly under the Jacob Zuma administration, have made the energy crisis worse. This is also made worse by as numerous acts of sabotage and criminal activity amongst syndicates within Eskom who have purported political ties.

Background

Analysts, executives, and government officials in South Africa and Eskom forecasted in a December 1998 report that unless steps are taken to stop it, Eskom would exhaust its electrical power reserves by 2007. The 1998 report advised restructuring Eskom into independent firms for energy generating and transmission to increase power supply and reliability. The national government did little in response to Eskom's requests for permission to expand capacity and consider the 1998 report's warnings. The Mbeki

administration was mentioned as the reason why no action was taken at the time since they were thinking about privatizing Eskom. Because of this, Eskom was unable to increase its generating capacity and meet the rising national demand for power starting in 2002.

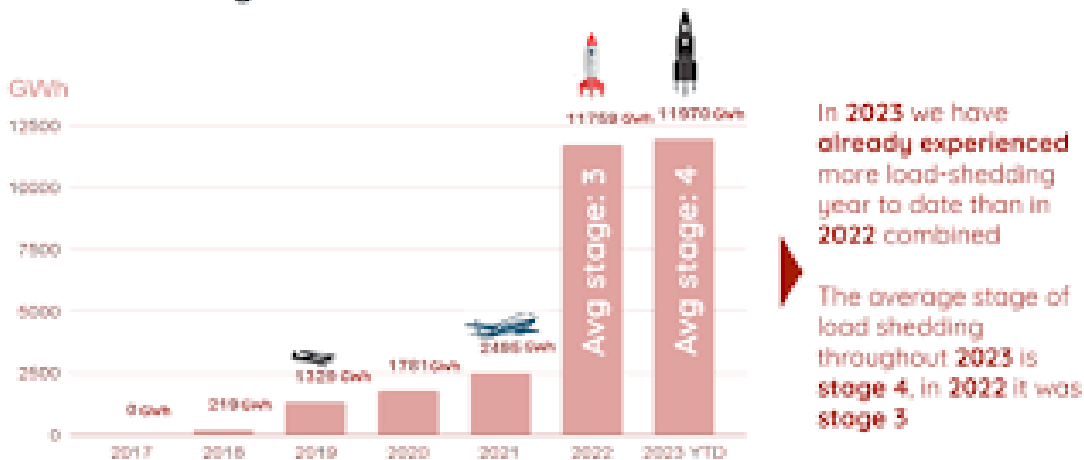
Since the country is heavily reliant on coal-fired power facilities, load-shedding has been a persistent issue in South Africa for many years. These plants are long standing and frequently need maintenance, which leads to malfunctions and unscheduled outages that lower the amount of electricity available to the grid. Additionally, operational problems and disruptions brought on by labor strikes have made the nation's coal supply unreliable.

To address this issue, South Africa has been attempting to replace coal as its primary energy source by introducing renewable energy sources like wind and solar power. The government's commitment to acquiring renewable energy and lowering the nation's greenhouse gas emissions has recently resulted in marginal progress. However, the switch to renewable energy is not without its difficulties. The intermittent nature of solar and wind energy implies that electricity generation can be inaccessible during periods of peak demand.

Load-shedding has occurred numerous times in South Africa since 2007 because of the nation's high demand for energy exceeding its capacity to deliver it, particularly for Eskom. Power is rationed at these times between various electrical grid areas across the nation and within local boundaries. Power outages often last two to four hours in affected areas. Despite having a national grid, some parts of South Africa experience load-shedding more frequently than others due to variations in local power generation capacity and challenges with electricity distribution.

In accordance with a predetermined schedule, Eskom has established eight stages of load-shedding as of December 2019. Each stage entails the controlled shutdown of a segment of the supply system, removing 1000 MW increments of demand. However, location-specific schedules could differ. On December 9, 2019, stage 6 (a 6000 MW reduction) was first put into effect.

Load-shedding in 2023 is now more than 2022's combined total



Since 2007, South Africa has experienced at least five distinct periods of load-shedding.

First period: 2007 – 2008

Chronic power shortages first appeared in late 2007 and continued through May of 2008. According to the investigative television program *Carte Blanche*, a portion of the issue is connected to the coal supply of the coal-fired power plants. Other reasons should be considered, such as a lack of qualified workers and rising electrical demand across the nation. For the first time ever, daily load-shedding took place for two weeks in January 2008.

Eskom came under fire for sending electricity to neighboring African nations while not having the resources to supply all South Africa's needs. Eskom, however, said on January 20th, 2008, that it had stopped exporting electricity. Despite some efforts, the desired growth rate of 6% per year was not achieved from 1996 to 2004. The government argued that the shortage was unexpected to them since the South African economy had risen more quickly than anticipated. During this time, the average GDP growth rate was 3.1%. The earliest date for the end of the power shortages was widely speculated to be 2012.

Second period: November 2014 – February 2015

The Majuba power plant's ability to produce electricity was lost on November 1st, 2014, when one of its coal storage silos collapsed. About 10% of the nation's capacity was produced by the Majuba power station, and its collapse blocked coal deliveries. On November 20, a second silo experienced a significant break, forcing the plant to shut down once again. Prior to this, temporary measures had been put in place to deliver coal to the plant.

Eskom began major stage three load-shedding on December 5 in South Africa following the shutdown of two power reactors on November 4 due to a lack of diesel. The depletion of the water reserve for the hydro plants was also said to be causing problems for the Palmiet and Drakensberg Pumped Storage Schemes. The highest load-shedding stage at the time was stage three.

Eskom was 4,000 megawatts (5,400,000 hp) short of the nation's 28,000-megawatt (38,000,000 hp) electricity demand on Thursday, November 4. The power company can produce 45,583 megawatts (61,128,000 horsepower), however due to "planned and unplanned" maintenance, it could only deliver 24,000 megawatts (32,000,000 horsepower). Due to an "unexplained incident" in March of 2014, one turbine of Eskom's Duvha Power Station remains not operational. After the December holiday season, load-shedding was supposed to start up again in February 2015 because of an industrial start-up.

Third period: February 2019 – March 2019

Eskom announced level four load-shedding in February 2019 in response to a brief lack of producing capacity, which started a new phase of load-shedding. This required the national grid to reduce its electricity use by 4,000 MW. As part of the level four load-shedding in mid-March of that year, Eskom initiated widespread, continuous power outages throughout the nation.

Fourth period: December 2019 – March 2020

Starting in December 2019, Eskom started another round of load-shedding. Since stage six was activated for the first time ever in December, South Africa has been going through its worst energy crisis. Eskom claimed that out of its approximate 44,000 MW nominal capacity, it was only able to provide about 13,000 MW of total capacity, which caused the national blackouts.

The fourth load-shedding period was attributed to a variety of causes, including the weather and accusations of sabotage and mismanagement. Wet coal and floods brought on by unusually severe rainfall in South Africa's Highveld region prevented several units from operating efficiently, most notably Medupi Power Station.

According to President Cyril Ramaphosa, the loss of 2,000 MW caused by an alleged act of sabotage by an Eskom employee was another factor in the load-shedding. Eskom's chief operating officer, Jan Oberholzer, publicly stated that the main cause of load-shedding was from neglect and a lack of maintenance over the previous twelve years, which led to an unpredictable and unstable system. The African National Congress and President Ramaphosa came under fire from opposition parties in South Africa for how they handled this crisis. When one of the sea water cooling pumps at the Koeberg Nuclear Power Station developed a problem in March 2020, an additional cycle of load-shedding (stage four) was initiated.

Fifth period: March 2021 – present

Due to the decreased demand for power during the COVID-19 epidemic and the ensuing economic recession, load-shedding was virtually discontinued. When the power plants in Matimba, Tutuka, Majuba, Kusile, Duvha, Kriel, Kendal, and Medupi broke down in March 2021, this came to an end. Stage two load-shedding was reinstated in May 2021 as a result of many power station failures at the Tutuka, Majuba, Kriel, Matla, Kusile, Medupi, and Duvha power stations. Level four load-shedding was announced by June 9, 2021.

The Electricity Regulation Act will be amended to raise the threshold for exemption from the requirement to obtain a license from the national energy regulator Nersa to generate electricity, from 1 megawatt to 100 megawatts, as President Ramaphosa announced on June 10, 2021. This would make it simpler for independent power producers to increase the nation's grid's capacity for power production.

Eskom said on October 7, 2021, that stage two load-shedding would start due to scheduled and unplanned outages after providing uninterrupted power for 77 days. Furthermore, Eskom announced on October 25, 2021, that capacity would be "constrained" through August 20, 2022, having a detrimental impact on the economy. Eskom predicted that removing the possibility of load-shedding will require an extra 4000MW to 6000MW of power capacity. Due to issues with the Medupi, Kusile, Matla, Lethabo, and Arnot power stations, Eskom announced on October 27, 2021, that stage four load-shedding will be applied for three days.

Stage four load-shedding resumed on November 5 after the 2021 local elections because of issues at the electricity plants at Kendal, Tutuka, Matimba, Majuba, and Lethabo. President Ramaphosa stated that the

continued reliance on Eskom, the only national generator, was a major threat to the power supply system in a post-election speech on November 8th.

Due to the failure of two generating units at the Kusile and Kendal power facilities, Eskom declared that level two load-shedding would be reinstated from February 2 to February 7, 2022. Early in March 2022, level four load-shedding was reported because of failures that removed 15,439 MW from the national grid. When about half of the national grid failed over Easter weekend in 2022, stage four load-shedding was extended.

June 2022 Strike

In late June 2022, load-shedding intensified to levels four and six, respectively, due to illegal strike action by NUMSA and NUM personnel. In addition to the loss of generating capacity caused by the strike, there was a loss of 2,766 MW owing to planned maintenance and a further loss of 17,395 MW due to power plant failures. Eskom issued a warning that stage six load-shedding might be necessary if the strike action went on. Eskom announced on June 28, 2022, that stage six load-shedding would be used that evening only twice since December 2019. When Eskom agreed to resume pay negotiations by the end of June, the strike was mostly over.

September 2022 Crisis

Up to half of Eskom's producing capacity was lost because of a collapse in generating capacity that occurred in mid-September 2022 in South Africa's electricity grid. Level four load-shedding was issued by Eskom due to fires, a broken coal conveyor belt at Kendal power station, and an electrical trip during testing at Koeberg Nuclear power station. A week later, level five load-shedding was announced. Generators at the Kusile and Kriel power stations tripped the day after level five load-shedding was declared, causing Eskom to execute level six load-shedding with the possibility of level eight load-shedding. By the end of 2022, South Africans experienced more than 200 days of power cuts, the most in a calendar year to date.

2023 Crisis

During a deteriorating national energy crisis, Eskom stated on February 22, 2023, that former CEO André de Ruyter, who was scheduled to leave the organization the following month, had gone immediately. The declaration was made following an interview with the eNCA news agency in which the company's former CEO expressed skepticism about the political will of the government to eradicate pervasive corruption at the power provider. President Cyril Ramaphosa selected Kgosientsho Ramokgopa as the nation's first ever electricity minister in an effort to address claims of wrongdoing at Eskom and the extraordinary power shortages.

Level six load-shedding was put into place on April 12, 2023, and was expected to last forever [91] due to the failure of generating units at the Tutuka, Kriel, Duvha, and Kendal power plants[92]. After seven pylons fell, because of metal thieves' activities, the cities of Pretoria and Mamelodi were left without electricity for protracted periods of time.

Sabotage and Corruption

The country's inability to sustain its current power generating capacity and rising costs are factors that have prolonged and intensified the energy crisis at the state-owned energy utility Eskom and its suppliers. The South African National Defense Force will be stationed at four Eskom power plants for an unspecified period, according to a spokesperson for President Ramaphosa in December 2022, "in response to the growing threat of sabotage, theft, vandalism, and corruption." An unnamed senior ANC MP was implicated, four criminal gangs had entrenched themselves within the national utility, and the government lacked the political will to address the matter, according to disputed remarks made by the then-Eskom CEO André de Ruyter in late February 2023. Additionally, De Ruyter said that in his view, "load-shedding is, to a large extent, attributable to crime and corruption."

Impact

South Africa has suffered a variety of negative effects as a result of the energy crisis. These include slowing down the nation's economic growth, making it more challenging to conduct business, raising crime rates, and influencing South African politics. According to a 2022 study by the University of Johannesburg, the frequent load-shedding since level six was implemented has drastically decreased "the overall happiness of South Africans." The Pretoria High Court was petitioned in 2023 to declare the energy crisis unconstitutional because of the hardship it has caused.

Health Care

Only 20% of public health-care facilities were immune to suffering power outages as of April 2023, while 80% were affected. However, big hospitals that were overwhelmed with patients coming from rural hospitals have also experienced a decline in patient care. Long waiting lists have most adversely impacted surgical care. In all public health institutions, water shortages were accompanied by a decline in health standards. Nurses were "tired of relying on mobile phone torchlights, unreliable generators, and using cooler boxes to keep vaccines and other medicines at the correct temperatures," according to the Health and Allied Workers Indaba Trade Union.

Crime

In 2022, it was reported that long periods of load-shedding were resulting in many increased incidents of crime. This included metal thieves using periods of when there is no power to steal equipment from power stations, sub-stations, and transmission lines thereby complicating Eskom's efforts to mitigate the energy crisis and costing the utility over R16.8 billion (US\$937 million) whilst also causing additional difficulties for municipalities. Incidents of metal theft, home invasions, and robberies due to a lack of security lighting and alarms had increased in some urban areas of South Africa during the period when level six load-shedding was implemented.

Protests

In mid-January 2023, protests over the frequency and extent of load-shedding broke out in the Durban community of Phoenix and the Johannesburg community of Boksburg.

Economic effects

South Africa's economic growth has been severely constrained by the energy crisis, making it increasingly difficult for the nation to address its high unemployment rates. According to estimates, the country lost out on 350,000 new jobs that could have been created in 2021 due to the power shortfall, which is projected to have lowered economic development by 3%. According to a 2022 study from the insurance firm Sanlam, the cost of replacing appliances because of power surges after load-shedding periods had surpassed the cost of replacing equipment because of burglaries.

The cost of resolving South Africa's energy crisis within three years was projected at R500 billion (US\$28 billion) by the business analysis company Intellidex in 2022. According to a study by Alexforbes, extended stage six load-shedding will cost the nation R4 billion (US\$216 million) per day in missed potential economic activity, and the costs rise exponentially with each level of the program.

Business

Large corporations with foreign investors began to experience the consequences of the electrical crisis in 2008 and reported these effects to the world, bringing the situation to the attention of possible foreign investors. Businesses in South Africa lost an estimated R13.72 billion due to load-shedding in the first half of 2015, and they also had to spend an additional R716 million on backup generators.

Because of the backup mechanisms in place, businesses including banks and telecommunications corporations have largely continued to run normally. Load-shedding, however, has resulted in lessened mobile network coverage as of November 2021, since backup batteries have also been stolen and cellphone towers have been vandalized during power shortages.

In 2019, load-shedding was cited as the biggest difficulty for small business owners. A survey of 3984 small business owners found that 44% of them had been significantly impacted by load-shedding, and 85% stated it had decreased their revenue. As a result, 40% of small companies experienced revenue losses of 20% or more during the load-shedding period, and 20% of owners stated that, if load-shedding continued at the same pace as in Q1 2019, they would have to think about cutting staff or closing their establishment. When load-shedding caused 40,000 of a poultry farmer's broiler birds to suffocate in February 2023, the farmer filed a lawsuit against Eskom for damages.

Latest News

In March 2023, the state-owned utility Eskom declared that power outages, which have been practically daily for months in South Africa and may run up to over twelve hours on some days, had been stopped "until further notice." According to Eskom spokeswoman Daphne Mokwena, "load-shedding was suspended today at 11:40 am (09:40 GMT) and until further notice, thanks to improved generation capacity and lower demand." The business stated on Twitter that "Eskom will immediately communicate any significant changes" but did not provide a timeframe for how long these improvements will allow the 60 million South Africans to live without power outages.

