WINDAC AFRICA

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WIRE FOR GROWTH!

SAWEA
South African Wind Energy Association

21 - 23 OCTOBER 2025
8:00 am – 5:00 pm

CAPE TOWN, SA
CTICC 2

2025 PRESENTATION

Rethinking South Africa's loadshedding in the lens of SAWEA: A systematic mapping study

Khumo Feni

23/10/2025

SPEAKER **OVERVIEW**

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In March 2020, credit rating agency Moody's noted that "Unreliable electricity supply continues to constrain South Africa's economic growth". In April 2020, Standard and Poor's affirmed, "In the second half of 2019, the economy shrank, due partly to a set of severe rolling power blackouts," and this was a factor in their confirmation of South Africa's sub-investment grade sovereign credit rating, a low rating which implies the country's inability to pay debt, consequently making the cost of borrowing high, and repelling investors.

PRESENTATION **OVERVIEW**

01 • Background

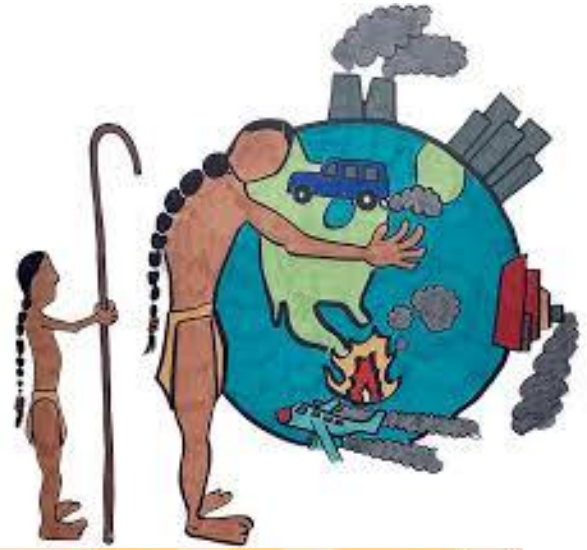
02 • Methodology

03 • Findings

04 • Conclusion & Recommendations

01 BACKGROUND

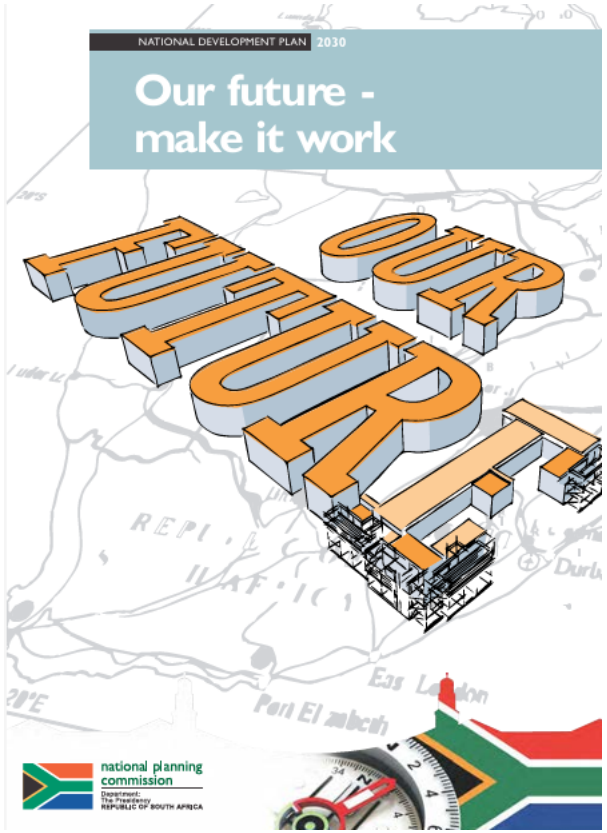
- Introduction
- The current trade war between SA and USA is impacting SA with constant inflation. With the already high consumer price index imposed by Covid-19, the cost of energy has skyrocketed for the already compromised energy system in South Africa.
- Loadshedding
- Although the country has achieved considerable progress in expanding electrification since 1994, energy access alone has not guaranteed energy access
- According to national statistics, rural households and low-income urban communities continue to rely on a mix of fuels such as paraffin, firewood, and coal, particularly for cooking and heating.
- The situation has been further exacerbated by recent load-shedding, infrastructure constraints, and rising electricity costs.
- Renewable energy, particularly wind power, has emerged as a strategic pathway for increasing energy generation capacity and promoting a just energy transition.
- The South African Wind Energy Association (SAWEA) represents a growing sector with significant generation potential and a strong policy advocacy role for energy justice.
- While the expansion of wind energy has clear environmental and macroeconomic benefits, its specific contribution to preventing loadshedding has not been adequately studied.



WINDAC 2025 SPEAKER PRESENTATION

SDG7 is the United Nations' Sustainable Development Goal 7, which aims to ensure universal access to affordable, reliable, sustainable, and modern energy by 2030. It includes targets to increase the share of renewable energy, improve energy efficiency, and enhance international cooperation to facilitate access to clean energy technologies and research. Achieving this goal is crucial for economic development, poverty alleviation, and climate change prevention.

The NDP 2030 plan **aims to shift South Africa's energy sector to include at least 20,000 MW of renewable energy (wind, solar, and hydro) by 2030**. This is intended to support economic growth, provide energy security, and address climate change by diversifying power sources away from coal. Key strategies include developing new generation capacity through independent power producers (IPPs) and investing in infrastructure like transmission lines.



02 METHODOLOGY

- Key research questions

- What was the impact of load shedding in South Africa?
- Who is affected by energy poverty in South Africa?
- What is the role of SAWEA in preventing the recent load shedding in South Africa?

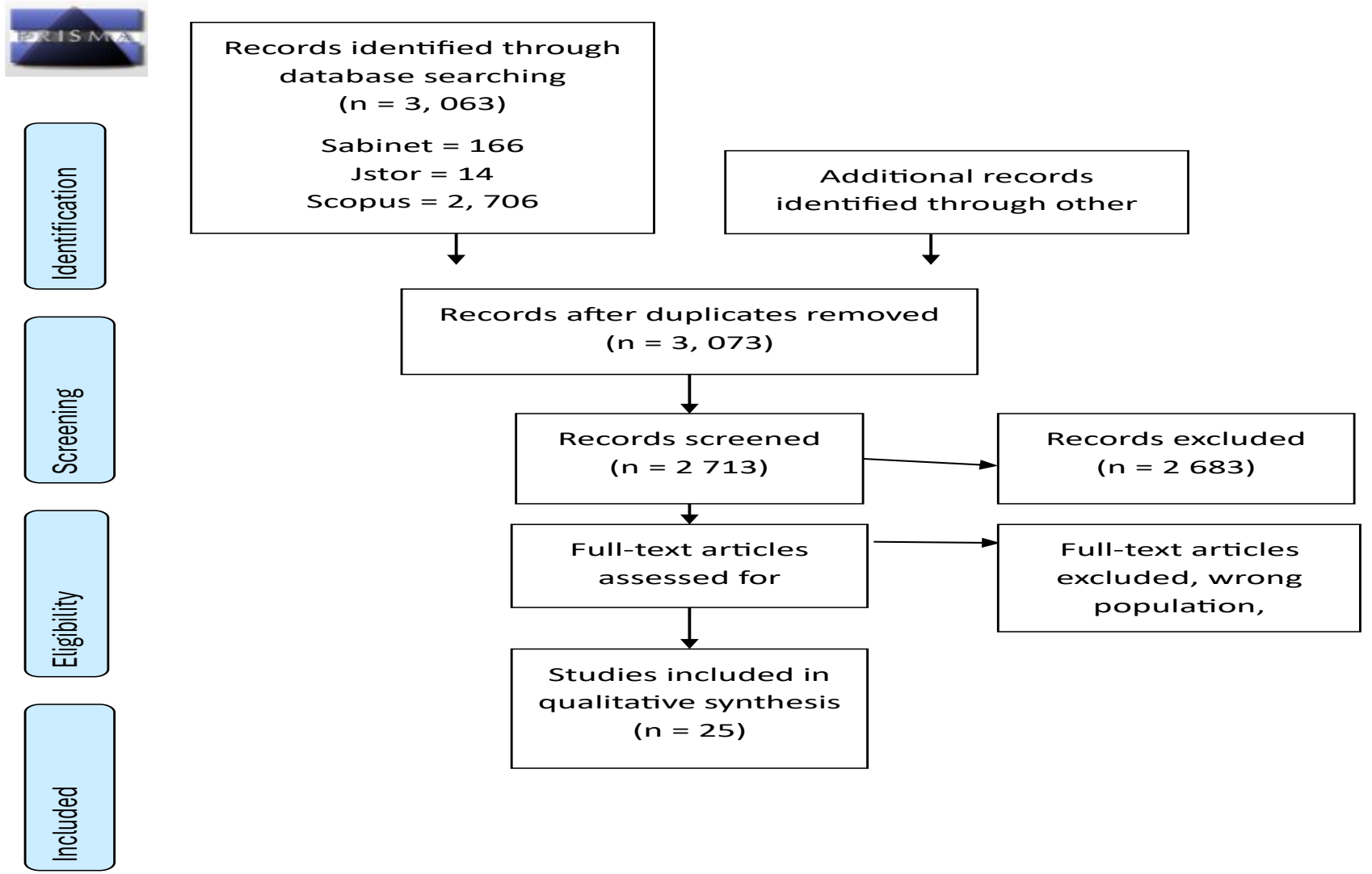
- Search words

- (consumer price index) AND (electricity) AND (South Africa)
- (Loadshedding) AND (GDP) AND (South Africa)
- (SAWEA) AND (Loadshedding)

- Databases

- Scopus
- Sabinet
- Jstor

02 METHODOLOGY



03 FINDINGS

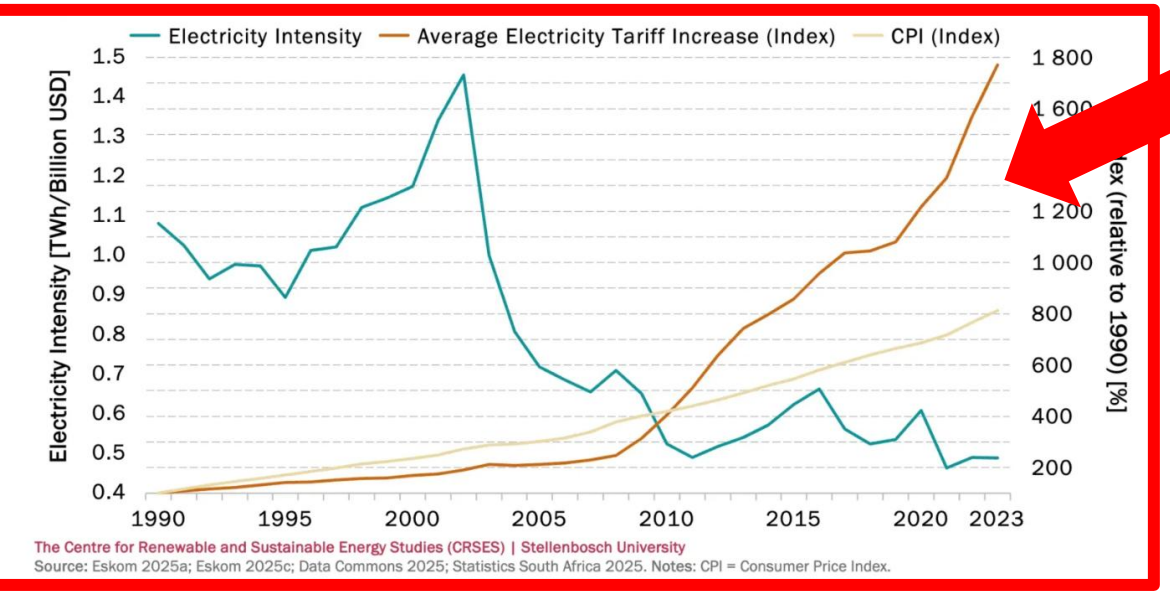


Figure 1 – Electricity generated in South Africa

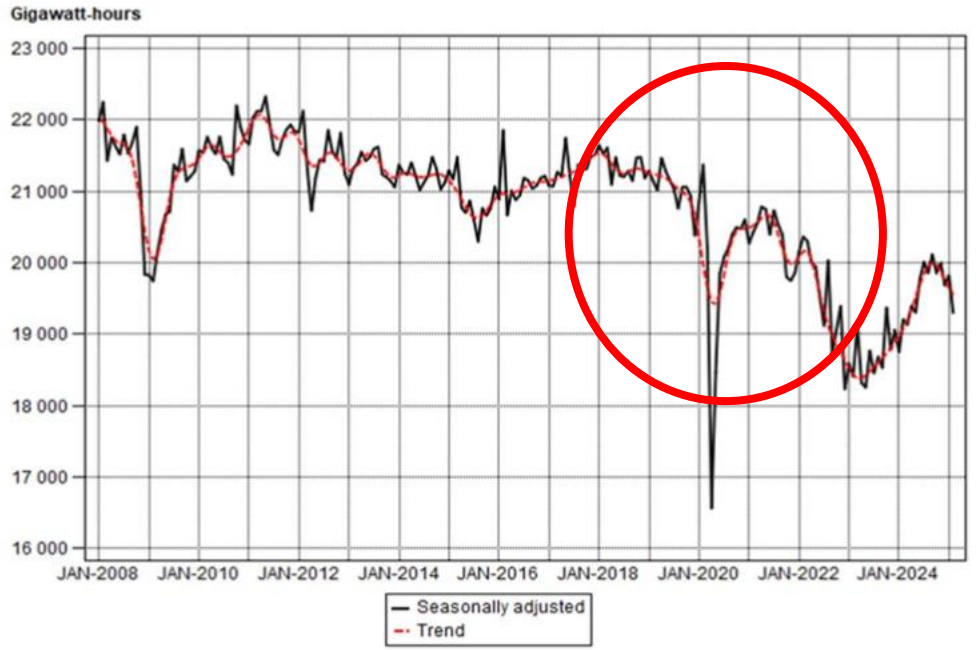
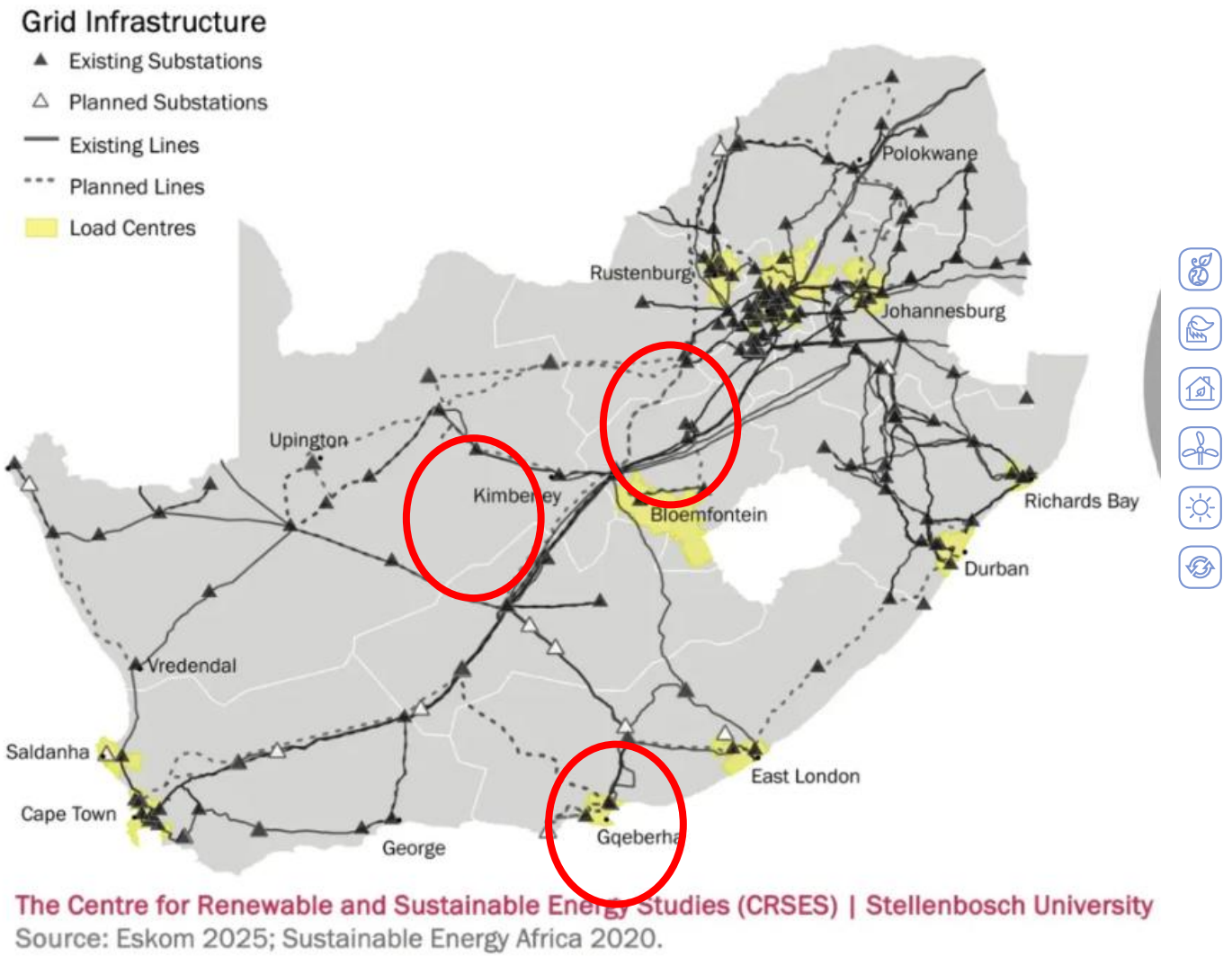


Table 9 – Volume of electricity delivered to provinces (gigawatt-hours)

Province	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25
Western Cape	1 599	1 560	1 542	1 610	1 506
Eastern Cape	766	707	670	710	643
Northern Cape	506	491	525	572	483
Free State	930	905	941	902	810
KwaZulu-Natal	3 294	3 172	3 128	3 146	2 865
North West	1 779	1 736	1 650	1 671	1 497
Gauteng	4 436	4 195	3 832	4 046	3 846
Mpumalanga	2 609	2 519	2 517	2 496	2 235
Limpopo	1 766	1 750	1 766	1 635	1 445
Total	**17 685**	**17 034**	**16 570**	**16 788**	**15 329**

Add text



Author	Research paper	Year of focus	Field of study	Evidence of energy poverty/Unjust energy transition	Impact & recommendation
Venter, Chivanga, Davies, Monyai, & Scott (2025)	Darkening nights and rooftop solar adoption under South Africa's electricity crisis: geographies of the energy apartheid	2025		Marginalized communities remain concentrated in under-resourced areas, where financial and infrastructural barriers to renewable energy adoption are compounded by geographic disparities in solar radiation (Mutumbi et al 2024)	However, such policies need to account for spatial and procedural inequalities in the South African contexts so as not to perpetuate energy disparities.
Qeqe, Kapingura, & Mgxekwa, (2022)	The Relationship between Electricity Prices and Household Welfare in South Africa	2000 to 2018	Economics	(i) South African household electricity demand is inelastic to changes in price of electricity; (ii) electricity prices in the country increased at a higher rate than the rate of inflation for most of the time during the study period, suggesting that households incurred increased expenditures to achieve their desired utility or satisfy their energy needs during this period; (iii) household total electricity expenditure is positively related to household total energy expenditure, implying that high household expenditure on electricity exerts upward pressure on the overall household energy budgets; and (iv) household total food expenditure is negatively related to household total energy expenditure. This shows that while policy makers achieved significant success with providing physical access to electricity, affordable access to this basic service is still a concern and affects the overall welfare of households in the country.	recommends a review of the country's electricity tariff structure to make affordability a key objective. Moreover, the study calls for coordinated efforts in addressing Eskom challenges which have also played a contributing role to the current energy crisis, characterized by an unreliable electricity supply and constantly increasing electricity prices

Author	Research paper	Year of focus	Field of study	Loadshedding impact	Recommendations
Walsh & Reeder (2021)	Estimating the Economic Cost of Load Shedding in South Africa	2007 and 2019	Econometrics	Agriculture: "...*suffered biggest losses due to load shedding relative to its contribution to GDP (over 5% of its output because of load shedding"* & Manufacturing: **42% (R14.4 billion)** of the total economic cost of load shedding	*building or procuring utility-scale renewable capacity*
Oliver, Nwamdi & Nwulu (2024)	Unlocking economic growth: Harnessing renewable energy to mitigate load shedding in Southern Africa	2000 to 2023	Engineering		
Apeh, & Nwulu, (2024)	Load shedding and its influence on South African Small, Medium and Micro Enterprise profitability, liquidity, efficiency and solvency	2008 - 2019	Qualitative, Business, review	**97% of all** South African businesses classify as SMMEs (Brendon, 2016; Viljoen & Struweg, 2016) **75% of South African SMME** business entities fail after operating for less than three years due to loadshedding (volatile electricity supply). "*Profitability, liquidity, efficiency, and solvency of South African SMMEs are adversely influenced by load shedding*." Another major external factor causing unsustainability of SMMEs in SA is the volatile supply of electricity – namely load shedding (Carlsson & Martinson, 2010; Ado & Josiah, 2015; Ligthelm, 2016; Semenya, 2019). South Africa's	government insurance programme for South African SMMEs that are formally registered, solely for the claiming of business expenditure caused by load shedding

Mlambo (2023)	Living in the Dark: Load Shedding and South Africa's Quest for Inclusive Development	1994 - 2023	Literature review	Viljoen (2023) notes that the South African economy could have grown by **close to 7%** in 2022 if loadshedding was not a stumbling block. Load shedding is keeping local and foreign investors away. Consumers cannot spend because they need to figure out where their next pay cheque might come from. In 2022, The citizen newspaper reported that the stage 6 of load shedding cost the country over R4 billion daily (The Citizen, 2022). unending power cuts businesses crippled businesses, forced them to shut down and retrench workers, consequently increasing poverty and inequality.	Loadshedding insurance (loadsurance) There are questions as to whether South Africa's introduction of IPPs can solve the current electricity challenges faced by the country. looking at the demand for electricity inSouthAfrica and the challenges experienced byEskom, the need for alternative electricity capacity has become a matter of national emergency. This will work against the government's quest for inclusive development unless drastic changes from a policy are instituted urgently.
Kock & Govender (2021)	Load-shedding and the Declining Energy Availability Factor: A Case Study of a South African Power Station	2020	Mixed method, interview with 70 Eskom Camden power station employee and managers	The impact of the declining energy available factor (EAF) (*reduced electricity production*) was significant, primarily on economic activities, employment, and revenue loss due to load-shedding. *A recurring cycle*. The five main causes for the low EAF were accounted to poor coordination, leadership, finance, process, and people. Adverse impact on Eskom.	Improve EAF through funding and consistent maintenance,, diversify coal providers and source improve ccoal quality.

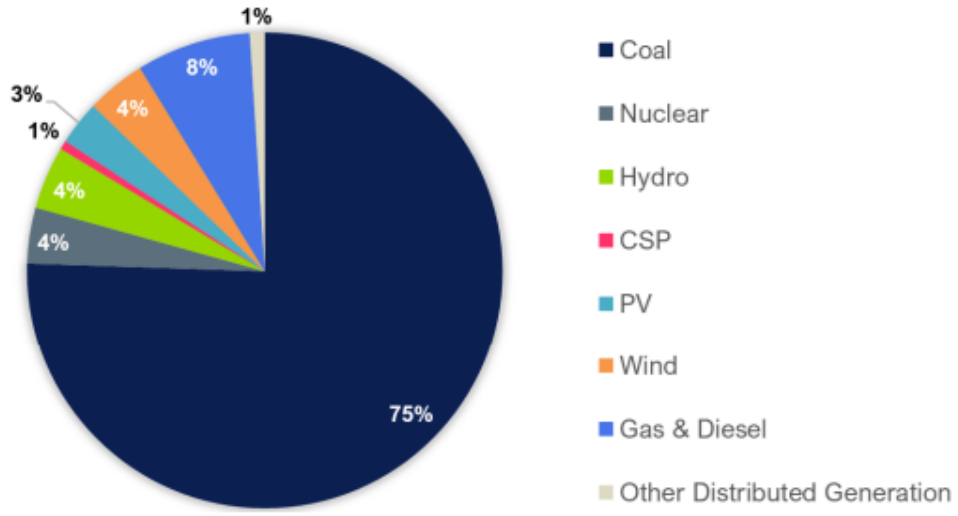
Akpeji et al., (2020)	Economic impact of electricity supply interruptions in South Africa	Qualitative, exploratory	Small businesses have been particularly affected, with an ***estimated 75%*** of them failing after being operational for less than three years due to load-shedding. load-shedding has had a significant impact on businesses' finances, resources, and performance. Load-shedding in South Africa has had a severe impact on the daily lives of people, causing disruptions in businesses, households, and the overall economy.	It is recommended that small businesses adopt alternative energy sources like solar power to increase the businesses' independence and mitigate the effects of load-shedding
Musabayana (2023)	The effects of electricity load-shedding on the performance of small and medium enterprises in Pretoria, South Africa: A case study of Marabastad Business Community		Reduced operation hours & revenue, declining profits, .	Government to intervene

	We have a lot to say about loadshedding": Exploring citizen engagements and perceptions on power cuts in South Africa	analysis to 4392 tweets from January 2023	Energy studies	"Loadshedding has become a significant threat to South Africa's socioeconomic development, prompting research across diverse fields. Studies have examined its impact on agriculture, housing market, mental health, and criminal behaviour" #*PowerToPeople March is tomorrow, so make sure you're there! 10 Darling Street, Parking area Loadshedding and Eskom's tariff increases affect everyone, no matter what their circumstances are. As a nation, let us stand together against load shedding!* *"@Abramjee @Eskom_SA @CyrilRamaphosa Our local popular Woolies has closed with a notice blaming loadshedding and the technical difficulties it has caused. Is this the beginning of many well-established businesses going down and poverty and job losses climbing steeply?"*	"The DA's list of potential solutions to load shedding includes unbundling Eskom into generation, transmission, and distribution, investing in the grid, and ramping up Independent Power Producer procurement."

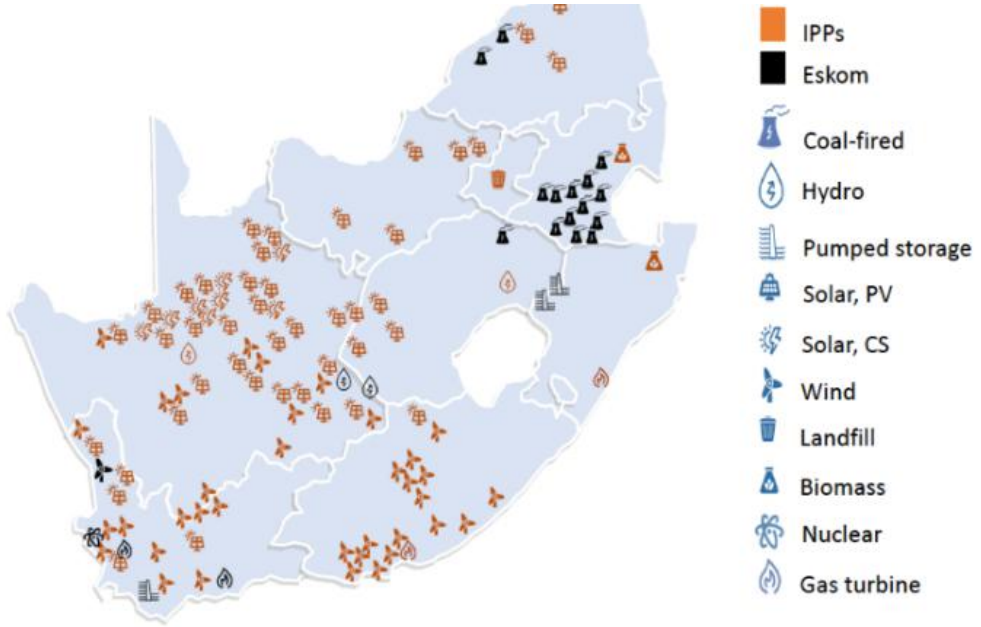
Author	Research paper	Year of focus	Field of study	Contribution to loadshedding reduction
Moodliar, & Davidson, (2024)	Unlocking Energy Stability: An Approach to Managing Load Shedding in eThekwini Municipality by Leveraging the Potential of Battery Energy Storage Systems	2024		With an initial investment of R 250 000 000, ten, 4 MWh, Lithium-Ion BESS maintained the continuity of supply during load shedding; however, the cost to do so translated to R 12.61 kWh, which is R 10.92 kWh more when compared to the grid price of electricity. However, this cost is significantly lower than the estimated Cost of Unserved Energy (COUE), which is R 29.05 GVA/kWh, where GVA represents the gross value added to the economy.

Latest status of renewable energy in South Africa

Figure 2: Breakdown of South Africa's total generation capacity



Source: DoE, 2019b



Source: Author compilation

Background of the IPPP Programme

Overall Goal:-

- To procure energy while contributing to broader national development objectives *viz.* job creation, social upliftment & widening the scope of economic ownership

REIPPPP Objectives:-

- Increase electricity supply, while reducing reliance on fossil fuels
- Stimulate an indigenous renewable energy industry
- Contribute to socio-economic development & environmentally sustainable growth

LIST OF MEMBERS: **A1 SPONSOR**

enel Green Power, NORDEX, GLOBELEQ, BioTherm Energy, MAINSTREAM RENEWABLE POWER SOUTH AFRICA, SERITI Green, SIEMENS Gamesa RENEWABLE ENERGY

LIST OF MEMBERS: **A2 MARKET LEADER**

AIIM, AMEA POWER, ENERTRAG, INFINITY Power, REATILE

LIST OF MEMBERS: **A3 CHAMPION**

actis, ArcelorMittal, AFRICAN CLEAN ENERGY DEVELOPMENTS, AURORA WIND POWER, EDF renewables, ENGIE, GRI Renewable Industries, GOLDWIND, JUWI, Lekela, M&D, redcap, Scatec, Vestas, voltalia, WKN Windcurrent, ZEST WEG Group

2 No. 27458 GOVERNMENT GAZETTE, 6 APRIL 2005

Act No. 40,2004 NATIONAL ENERGY REGULATOR ACT, 2004

(English text signed by the President.)
(Assented to 30 March 2005.)

ACT

To establish a single regulator to regulate the electricity, piped-gas and petroleum **pipeline** industries; and to provide for matters connected therewith.

BE IT ENACTED by the Parliament of the Republic of South Africa, as follows: —

CONTENTS

Sections

CHAPTER I 5

DEFINITIONS AND OBJECT

1. Definitions
2. Object of Act

CHAPTER II

NATIONAL ENERGY REGULATOR 10

3. Establishment of Energy Regulator
4. Functions of Energy Regulator
5. Composition of Energy Regulator

- Several scholars define energy poverty not only by lack of connection to the grid, but also by unreliable supply, poor quality, and unaffordable tariffs (Bohlmann et al., 2023; Tait & Winkler, 2012). The Energy Poverty Index (EPI) and other multidimensional frameworks highlight that access alone is insufficient for energy security. Rural provinces such as the Eastern Cape and Limpopo remain particularly vulnerable, while urban informal settlements also experience energy insecurity due to infrastructure deficits and affordability barriers.
- South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) has attracted billions in investment and added thousands of megawatts of clean energy to the grid. SAWEA has been instrumental in policy advocacy, industry coordination, and capacity-building initiatives (SAWEA, 2024). Wind energy represents one of the most rapidly scalable renewable sources in the country.
- SAWEA's contributions extend beyond energy generation. Its initiatives include community trust programs, local skills training, energy education campaigns (e.g., energy DRIVE), and active involvement in the Renewable Energy Masterplan (SAREM). However, academic studies directly linking these contributions to measurable reductions in energy poverty are limited.

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THANK YOU FOR LISTENING!

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