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SOUTH AFRICA'S MINIGRID REVOLUTION:

Unpacking the Regulatory Adjustments that Unlocked Deployment

African Union

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Chief Executive Officer, Granville Energy

Tabi T. Tabi is a visionary leader and serial entrepreneur. As the Founder and CEO of Granville Industries, Tabi is leading Granville Energy's mission to expand access to decentralized power solutions across Africa. With a focus on regulatory reform, distributed energy, and innovation, he authored this report to share insights on South Africa's evolving energy landscape and the critical role of minigrids in driving inclusive growth.

EXECUTIVE SUMMARY

Overview

South Africa's energy sector has undergone a profound transformation, driven by a persistent electricity supply crisis and the strategic imperative to diversify generation capacity. This report examines the specific regulatory adjustments, primarily enacted from 2021 onwards, that have been instrumental in unlocking minigrid deployment and fostering broader distributed generation (DG) within the country.

The analysis reveals a deliberate shift from a heavily centralized, monopolistic power utility model towards an environment that actively embraces private sector participation and decentralized energy solutions. Key policy changes, including the significant relaxation of licensing thresholds for embedded generation projects in 2021, the subsequent complete removal of licensing requirements in 2023, and the comprehensive reforms introduced by the Electricity Regulation Amendment Act of 2024, have collectively dismantled long-standing barriers. These adjustments have streamlined regulatory processes, enhanced investor confidence, and created a more competitive and diversified electricity market. The unbundling of Eskom and the establishment of an independent Transmission System Operator (TSO) are foundational to this liberalization, directly facilitating the integration and scalability of minigrids. This report concludes that these targeted regulatory interventions have been critical in accelerating minigrid growth, positioning them as a vital component of South Africa's future energy landscape.

"These targeted regulatory interventions have been critical in accelerating minigrid growth, positioning them as a vital component of South Africa's future energy landscape."
— Granville Energy, 2025

CHAPTER 01

THE IMPERATIVE FOR MINIGRIDS IN SOUTH AFRICA

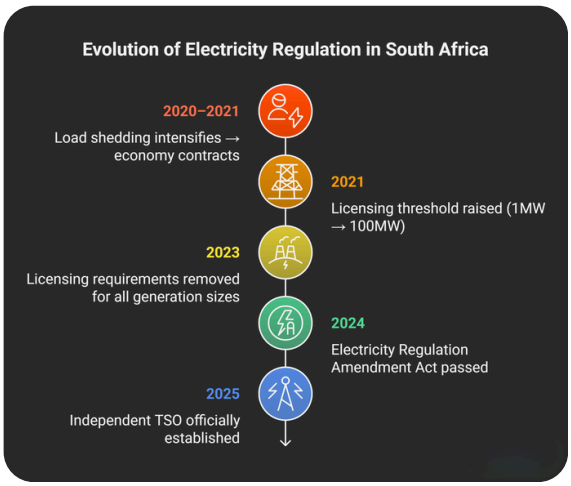
INTRODUCTION: THE IMPERATIVE FOR MINIGRIDS IN SOUTH AFRICA

South Africa has grappled with a severe and enduring energy crisis, marked by chronic electricity undersupply and frequent load shedding. This operational instability has had a significant detrimental effect on the national economy, leading to a substantial reduction in economic output. The critical nature of this shortfall has necessitated an urgent and comprehensive re-evaluation of the country's energy strategy, emphasizing the need for diversified and rapidly deployable generation capacity.

"Minigrids are no longer optional infrastructure—they are strategic assets in delivering affordable, reliable, and inclusive energy access for South Africa's most vulnerable regions."

In this context, **minigrids have emerged as a pivotal solution.** These decentralized generation and distribution systems are designed to provide electricity to unserved or underserved locations, effectively reducing the strain on the national grid and offering a more reliable power supply than the often-intermittent centralized system. Beyond merely providing light, minigrids contribute significantly to socio-economic development by enabling productive uses of energy, fostering job creation, and stimulating local economic activity. Their ability to deliver higher tiers of energy service, ranging from 50 to 2000 kWh per household per year, positions them as a robust complement to traditional grid infrastructure—particularly in areas where grid extension is either technically unfeasible or financially prohibitive.

Historically, South Africa's electricity sector was characterized by the near-century-long monopoly held by the state-owned utility, **Eskom**. This vertically integrated structure, while historically foundational, created a centralized system that was ill-suited for the agile deployment of decentralized energy solutions like minigrids. The regulatory environment prior to recent reforms was largely prescriptive and cumbersome, posing significant barriers for independent power producers (IPPs) and minigrid developers.



The escalation of the energy crisis created a clear and urgent impetus for **policy reform**. The severity of the power deficit and its direct impact on the economy compelled policymakers to actively pursue liberalization of the energy market. This was not simply a proactive strategic choice, but a reactive necessity—driven by the pressing need to stabilize and expand the national electricity supply. As a result, minigrids have transitioned from being a complementary technology to a **strategic imperative** in the journey toward energy security and universal access in South Africa.

CHAPTER 02

PRE-REFORM LANDSCAPE: SIGNIFICANT BARRIERS TO MINIGRID DEPLOYMENT

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Prior to the pivotal regulatory adjustments that began in 2021, the landscape for minigrid and broader distributed generation deployment in South Africa was fraught with substantial obstacles. These barriers were multifaceted, encompassing regulatory, licensing, and financial dimensions, which collectively stifled investment and slowed the pace of electrification.

A primary impediment was the stringent licensing regime. Projects with a generation capacity exceeding 1MW were mandated to obtain a license from the National Energy Regulator of South Africa (NERSA). This licensing process was notoriously time-consuming, with NERSA's official decision timeframe for a generation license extending to 120 days.

> *"Licensing delays alone could derail a project's momentum—120 days of uncertainty was too high a cost in a fast-evolving energy market."*
> *— Industry Developer Testimony*

Such protracted approval periods introduced significant delays and uncertainty for developers, impacting project viability and investor confidence.

Compounding the licensing complexities was the pervasive uncertainty surrounding grid connections. Independent Power Producers (IPPs) and minigrid developers frequently encountered a "challenging regulatory landscape characterised by uncertainty in securing grid connections". Eskom's approval processes for connecting new generation capacity were intricate and opaque. Critically, the grid capacity indicated at the time of an application could change by the time the approval process was finalized, introducing a high degree of variability that deterred long-term investment planning.

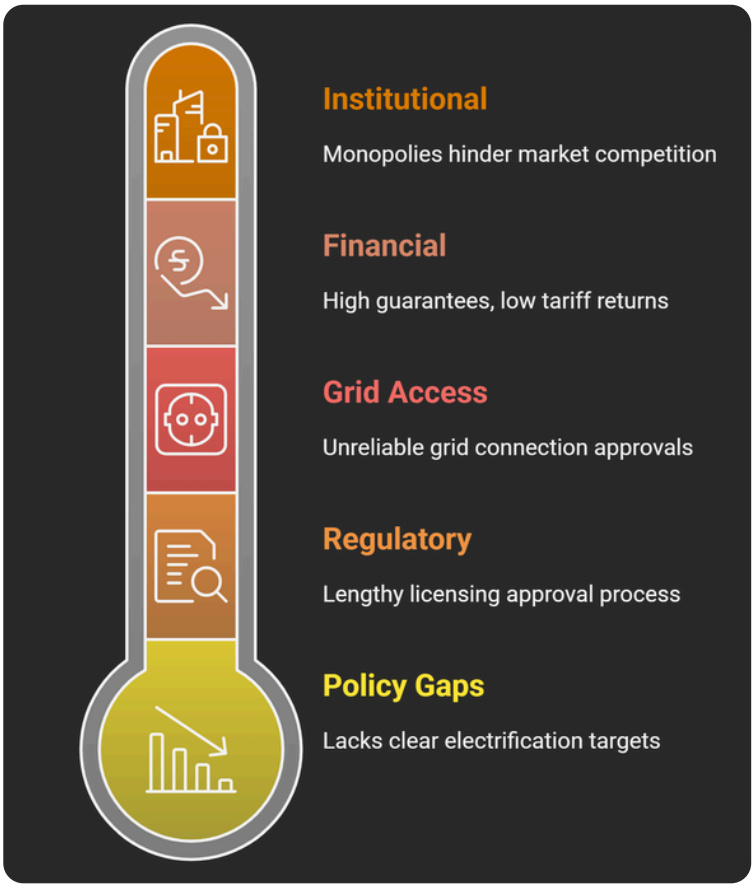
Financial hurdles were equally formidable. The existing regulatory requirements often necessitated "substantial financial guarantees" from developers, significantly increasing the upfront costs associated with project development. This financial burden disproportionately affected smaller developers, limiting their capacity to see projects through to completion. Furthermore, many minigrid projects were not economically viable without some form of government subsidy, yet the sustainability and effective design of these subsidy mechanisms remained a persistent challenge. The prevailing low electricity tariffs, frequently mandated to maintain parity with on-grid power prices, rendered minigrid projects unattractive to private sector investment. Access to affordable, long-term financing was also severely constrained, further exacerbating the capital-intensive nature of these projects.

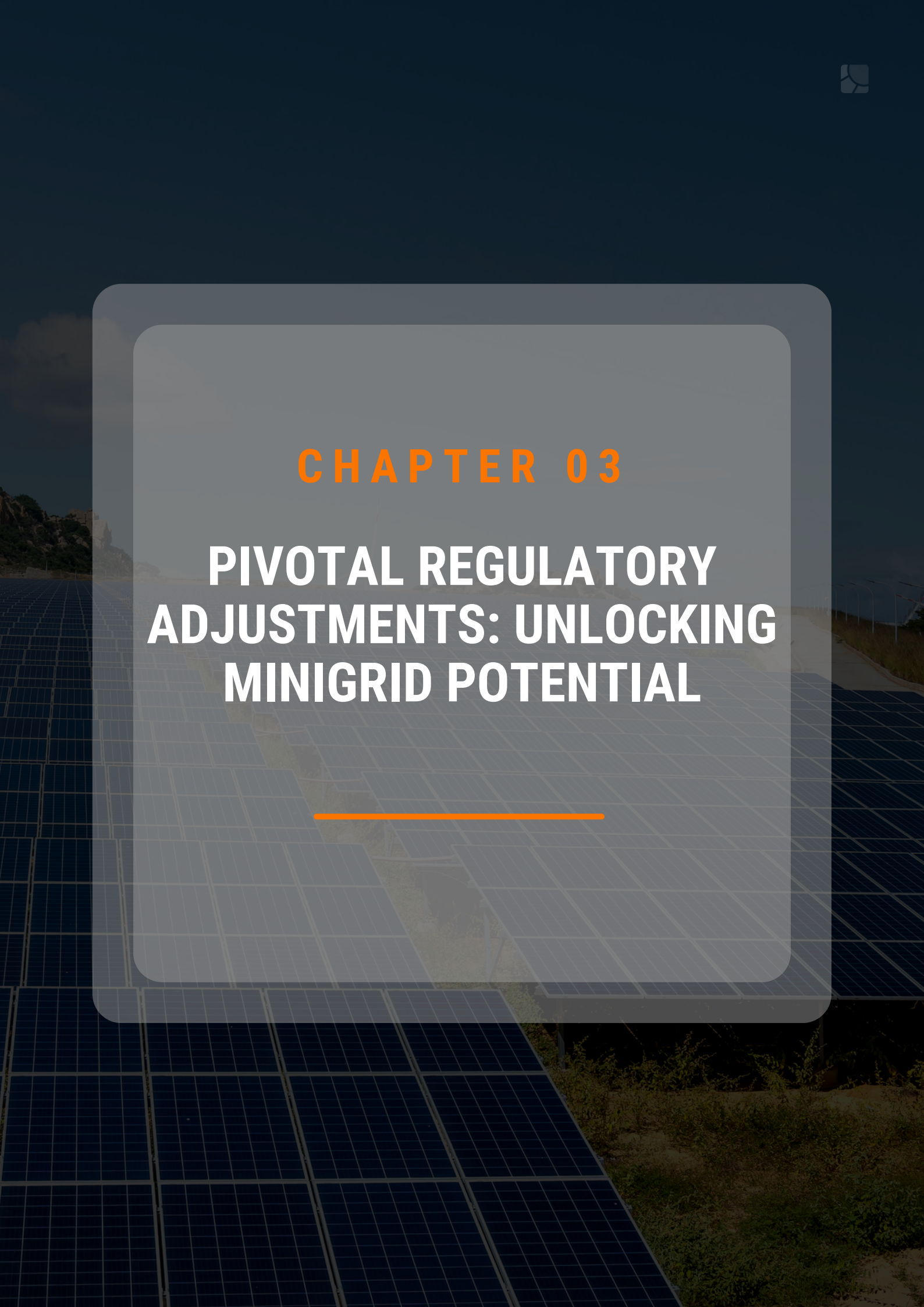
Eskom's long-standing monopoly presented a significant structural barrier. As a vertically integrated entity and the sole buyer at the wholesale level, Eskom's dominant position inherently limited competition in the generation market. While Eskom eventually played a role in facilitating reforms, it was "initially resistant to DERs," which naturally impeded the growth of distributed generation. The absence of clear and adequate regulations for defining wheeling tariffs – the charges for transmitting privately generated electricity across the national grid – also hindered private investment in transmission infrastructure, which is crucial for integrating distributed energy resources.

A pervasive issue across the sector was the "slow pace of regulatory approvals," which was identified as a "significant impediment to the sector's growth" not just in South Africa but across Africa.

This regulatory bottleneck was widely recognized as threatening universal energy access, leading to calls for a "paradigm shift in regulatory approaches that accelerates project approvals and facilitates market entry". Moreover, many countries, including implicitly South Africa, lacked comprehensive rural electrification plans with specific targets for minigrid deployment and detailed data to inform optimal site selection. Existing regulatory frameworks were often designed for large-scale, centralized power plants, making them ill-suited for the unique characteristics and rapid deployment needs of minigrids, which were often stuck in pilot phases rather than achieving full-scale national implementation.

The convergence of these regulatory, licensing, and financial obstacles created what could be described as a "regulatory chokehold" on minigrid deployment. Each barrier amplified the others: high development costs were exacerbated by slow and uncertain approval processes, and the lack of clear grid access rules further diminished project viability. This systemic entanglement of challenges created an environment of unpredictability and high risk, effectively deterring the necessary private investment and preventing minigrid projects from moving beyond limited pilot stages to achieve meaningful scale. This situation highlighted the urgent need for a comprehensive overhaul of the regulatory framework to foster a more predictable and investor-friendly environment.





CHAPTER 03

PIVOTAL REGULATORY ADJUSTMENTS: UNLOCKING MINIGRID POTENTIAL

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South Africa's response to its energy crisis has involved a series of strategic regulatory adjustments, progressively dismantling barriers and creating a more enabling environment for minigrid deployment and broader distributed generation. These policy shifts, particularly from 2021 onwards, represent a fundamental reorientation of the country's electricity sector.

The 2021 Licensing Threshold Increase (1MW to 100MW)

A significant turning point occurred in August 2021, when the South African government substantially relaxed the approvals required for Distributed Energy Resources (DER) projects. This was achieved by amending Schedule 2 of the Electricity Regulation Act, which raised the licensing threshold for generators from 1MW to an unprecedented 100MW.

"Projects with a generation capacity of up to 100MW no longer required a NERSA license."

This change unlocked 80+ projects and marked one of the most significant disruptions in decades.

This adjustment represented a ten-fold increase over the 10MW threshold previously considered and doubled the 50MW capacity that the private sector had been advocating for, signaling a decisive policy shift.

The immediate impact was profound: projects with a generation capacity of up to 100MW no longer required a NERSA license, thereby significantly reducing bureaucratic hurdles and accelerating project implementation timelines. This change was widely recognized as one of the most significant disruptions in the South African power market in decades, creating new opportunities for renewable energy projects to be sited more efficiently, even if not co-located with the consumption point. This initial liberalization quickly unlocked a pipeline of over 80 projects, demonstrating the immediate positive response from the private sector.

The 2023 Removal of Licensing Requirements

Building on the success of the 2021 adjustment, South Africa further liberalized its regulatory framework in January 2023. This progressive step saw the complete removal of the requirement to secure a license for generation facilities of unrestricted capacity, provided they have a point of connection on the transmission or distribution power system. This move effectively transitioned the regulatory approach from a high threshold to no threshold for grid-connected embedded generation, signifying a deeper commitment to market liberalization.

This policy shift further streamlined processes, drastically shortening the timeframes for embedded generation projects compared to the previous 120-day NERSA licensing period. The government explicitly stated that this measure was intended to "encourage further growth and investment in the energy sector and promote a reliable electricity supply," directly aiming to alleviate the energy crisis and provide much-needed economic relief. While the licensing requirement was removed for larger projects, Small Scale Embedded Generation (SSEG) systems under 100kW still require registration with the utility as prescribed by NERSA, and those between 100kW and 100MW require NERSA registration if grid-tied. This tiered approach ensures appropriate oversight while minimizing unnecessary regulatory burden.

The Electricity Regulation Amendment Act, 2024

The enactment of the Electricity Regulation Amendment Act in August 2024, which became fully effective in January 2025, represents a monumental legislative overhaul of South Africa's electricity sector. This Act amends the 2006 Electricity Regulation Act, specifically addressing contemporary challenges, fostering competition, and actively encouraging private investment across the energy landscape.

A cornerstone of this Act is the establishment of an open and diversified market system. It aims to dismantle Eskom's long-standing vertically integrated structure, effectively ending its century-long monopoly and introducing robust competitive market mechanisms. This critical reform empowers private enterprises to participate directly and freely in electricity market transactions, and significantly, grants residential, commercial, and industrial consumers the autonomy to choose their electricity providers based on price, service quality, and reliability.
Another pivotal provision is the creation of an Independent Transmission System Operator (TSO). The Act mandates the establishment of a state-owned TSO within five years, which will independently own, operate, and maintain the national grid, ensuring reliable electricity delivery. This TSO is set to replace Eskom as the primary electricity offtaker, requiring all existing and new generation projects to enter into Power Purchase Agreements (PPAs) with this independent entity. NERSA's role in tariff approval persists, ensuring cost recovery for utilities while simultaneously promoting key policy objectives, including renewable energy development and supply security.

Furthermore, the Act introduces the removal of mandatory competitive bidding requirements for new generation projects. This reform grants the Minister of Electricity and Energy discretionary authority over project approvals. This change allows financially robust power investors to bypass the often-protracted competitive tendering processes, such as the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), and instead submit project proposals directly to the Minister. This is expected to significantly improve project implementation timelines and accelerate deployment.

These regulatory adjustments demonstrate a clear pattern of phased deregulation, reflecting an adaptive governance approach. The initial increase of the licensing threshold to 100MW in 2021 served as a crucial test, and its demonstrable success in unlocking a pipeline of projects provided the necessary confidence and impetus for the subsequent, more comprehensive removal of the licensing requirement in 2023, and the broader market reforms enshrined in the 2024 Act. This indicates that South African policymakers progressively deepened the reforms as the energy crisis persisted and the benefits of increased private sector participation became unequivocally clear.

This progression also signifies a fundamental shift from a "permission-to-operate" paradigm to one of "market participation." Previously, NERSA licensing, even at a 1MW threshold, implied a highly controlled, permission-based system where the regulator exerted significant control over market entry. With the removal of licensing requirements, particularly for projects of unrestricted capacity, the emphasis has shifted to a system of "registration" with the utility for grid-tied systems. The Electricity Regulation Amendment Act further solidifies this by enabling direct participation in an "open and diversified market system". This represents a profound philosophical shift from a centralized, utility-driven model to one that prioritizes market forces, competition, and private investment as the primary drivers for energy security and expansion. It effectively reduces the gatekeeping role of the traditional utility and regulator, empowering developers and consumers alike.

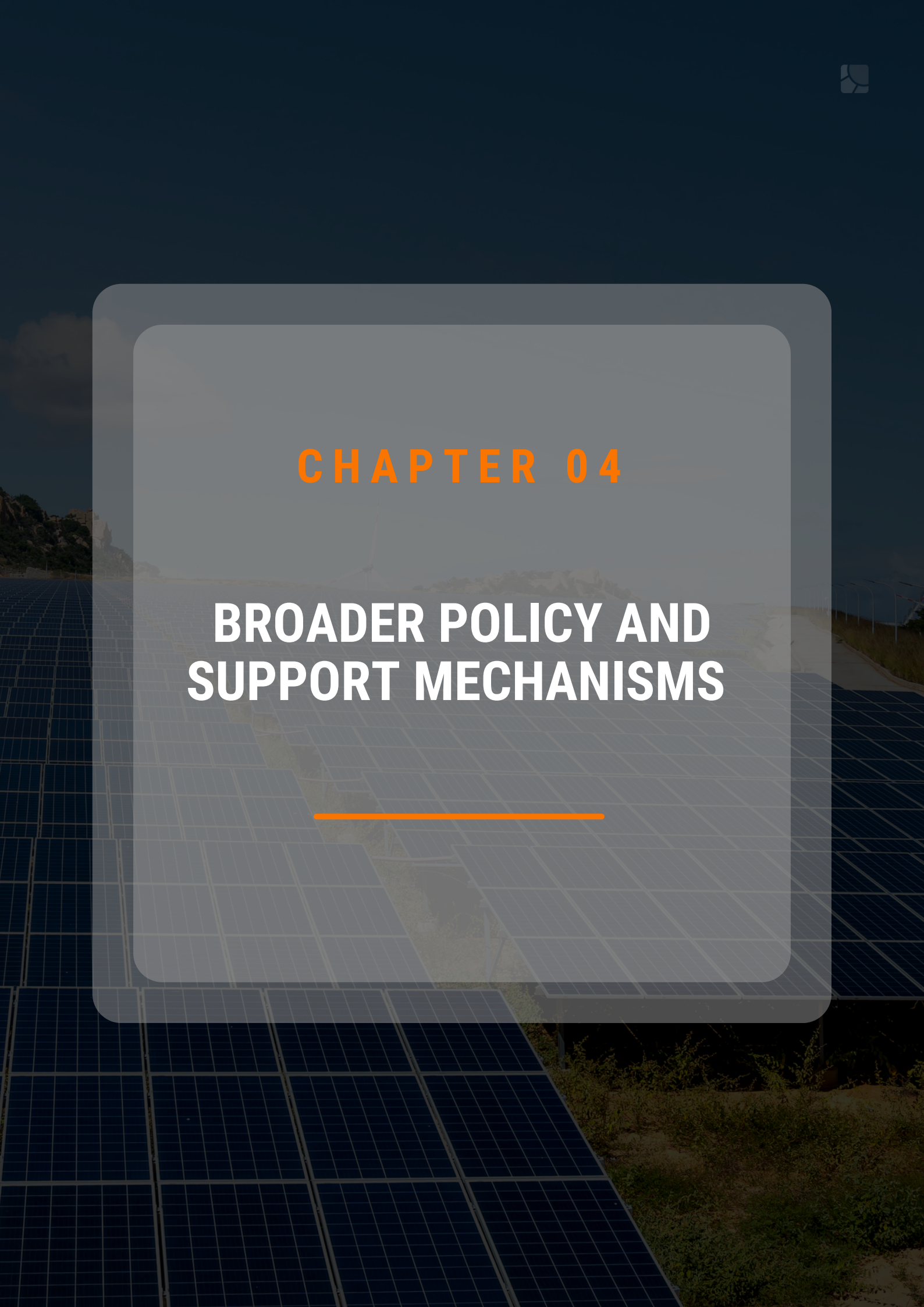
The establishment of an independent TSO is particularly critical for minigrid integration. Historically, Eskom's monopoly and the "uncertainty in securing grid connections" were major impediments for IPPs. A neutral, independent TSO is specifically designed to provide "fair access to all producers" and manage grid operations in a competitive market environment. This directly addresses the historical challenges of grid access and wheeling (the transmission of privately generated power across the grid), making it significantly easier for minigrids to connect, potentially sell excess power back to the grid, and integrate seamlessly into the broader energy system.

This structural change enhances the commercial viability and scalability of minigrid projects by moving from a system where the incumbent utility could implicitly or explicitly hinder competition to one that is structurally designed to facilitate it.

Table 1: Key Regulatory Adjustments and Their Impact on Minigrid Deployment

Regulatory Adjustment	Date of Implementation	Clause/Provision	Direct Impact on Minigrids	Broader Market Impact
Licensing Threshold Increase	August 2021	Amendment to Schedule 2 of ERA	Removed NERSA licensing for ≤100MW projects	Unlocked 80+ projects; encouraged DER investment
Removal of Licensing Requirement	January 2023	Licensing removed for unrestricted capacity	Faster approvals; lighter regulatory load	Boosted private participation; eased energy crisis
Electricity Regulation Amendment Act	August 2024 (enacted), January 2025 (in effect)	Unbundling of Eskom; creation of TSO; open market enabled	Ensured grid access and market entry for minigrids	Ended monopoly, introduced consumer choice, reinforced investment climate

Rationale for Table 1: *This table provides a concise, comparative overview of the most impactful regulatory changes. It highlights the specific policy mechanisms, their implementation dates, and their direct and broader implications. This structured presentation allows for quick comprehension of the sequence and cumulative effect of these reforms, demonstrating how each adjustment built upon the previous one to progressively open the market for minigrid deployment.*



CHAPTER 04

BROADER POLICY AND SUPPORT MECHANISMS

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Beyond the direct regulatory adjustments, a broader ecosystem of policy and support mechanisms has played a crucial role in enabling minigrid deployment in South Africa. These complementary initiatives are essential for creating a truly attractive and sustainable environment for private investment.

Tax Incentives

Financial incentives have been strategically deployed to stimulate investment in renewable energy, which is a primary source for minigrids. In February 2023, the South African government announced a temporary expansion of its renewable energy tax incentive scheme. This expansion, amounting to ZAR 5 billion (USD 275 million) in tax support, allows businesses to claim a 125% deduction in the first year for all renewable energy projects, with no thresholds on generation capacity.

"Incentives like the 125% depreciation not only reduce CAPEX pressure but send a clear signal: South Africa is open for clean energy business."

This is a significant improvement from previous provisions, which allowed a 50% deduction in the first year for projects over 1MW, and 100% for PV projects below 1MW. Such accelerated depreciation on renewable energy equipment directly reduces the financial burden on investors, improving the economic viability of minigrid projects and encouraging greater capital inflow into the sector.

International Support and Funding

International development partners have provided substantial support, recognizing South Africa's critical energy needs and its commitment to a just energy transition.

- **World Bank:** US$1.5 billion loan for structural reforms—focused on strengthening the transmission system, enabling private transmission investment, and supporting distributed generation (including household feed-in).
- **European Union:** €4.7 billion Just Energy Transition pledge, including €400 million from the European Investment Bank in collaboration with local banks.

This international backing **injects crucial capital** and signals global confidence in the sector, **de-risking investments** and unlocking private capital through blended finance models—especially critical in previously underdeveloped minigrid markets.

African Regional Harmonization Efforts

South Africa also benefits from broader regional initiatives aimed at standardizing and streamlining minigrid regulations across the African continent. The African Forum for Utility Regulators (AFUR), in partnership with GET. transform, has launched the African Model Mini-Grid Regulations Tool.

This pioneering IT-based solution is designed to help governments and regulators develop, update, and adapt their mini-grid policies in line with international best practices. The tool offers customizable regulatory frameworks, providing templates reviewed and endorsed by numerous African and international organizations. While not specific to South Africa, such harmonization efforts foster a more predictable and investor-friendly environment across the continent, indirectly benefiting South Africa by promoting best practices and facilitating cross-border investment and knowledge sharing.

The combination of these direct regulatory adjustments with broader policy and support mechanisms highlights a holistic approach to energy sector reform. It suggests that regulatory changes, while foundational, are most effective when complemented by financial incentives and robust international partnerships. This integrated strategy is crucial for reducing investment risk, improving the financial viability of projects, and ultimately accelerating the deployment of minigrids and other distributed energy resources. The emphasis on regional harmonization further indicates a recognition that shared regulatory challenges across Africa can be addressed through collaborative development of best practices, benefiting individual nations like South Africa.

CHAPTER 05

IMPACT ON MINIGRID DEPLOYMENT AND MARKET GROWTH

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The confluence of these regulatory adjustments and supportive policy measures has demonstrably spurred minigrid deployment and catalyzed significant growth in South Africa's distributed generation market.

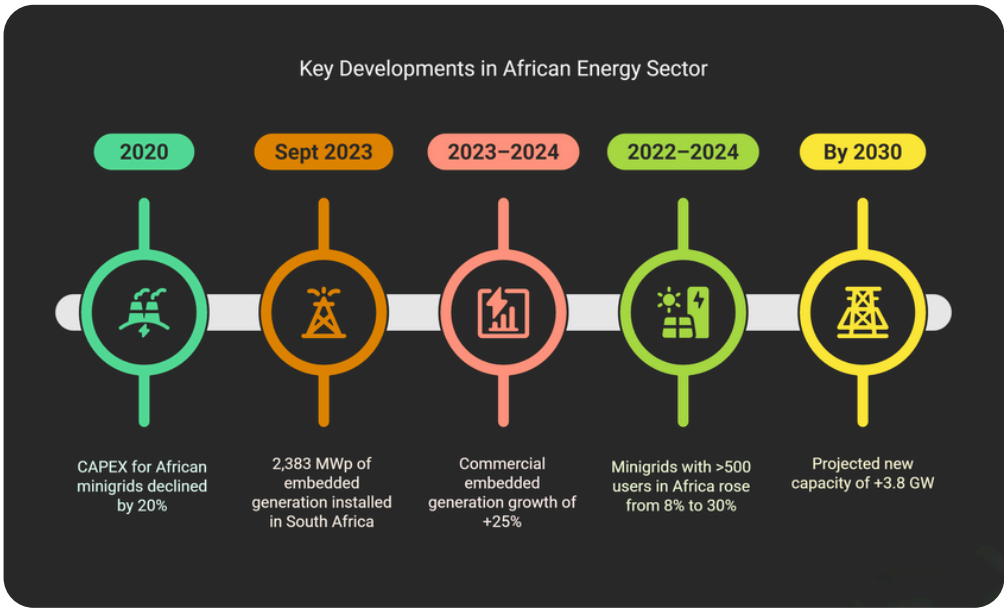
Private Sector Participation and Speed of Deployment

A primary outcome has been the surge in private sector participation. The relaxation and subsequent removal of licensing requirements have significantly reduced the barriers to entry for Independent Power Producers (IPPs) and distributed energy resource (DER) providers. This has led to streamlined development timelines for new projects, making private investment in generation capacity more attractive. Businesses across various sectors, including agriculture, manufacturing, and retail, are increasingly turning to embedded generation solutions like rooftop solar, battery storage systems, and minigrids to meet their own energy needs and mitigate the impact of load shedding. This trend reflects a direct response to the improved regulatory environment and the pressing need for reliable power.

Faster Project Turnaround and Market Confidence

The market has responded with accelerated project timelines. With reduced bureaucratic hurdles and faster approval processes, developers can bring projects online more quickly. This efficiency is critical for addressing South Africa's immediate energy deficit and for realizing the economic benefits of new generation capacity.

While South Africa-specific minigrid data is limited, continental and sector-wide indicators highlight strong upward trends:

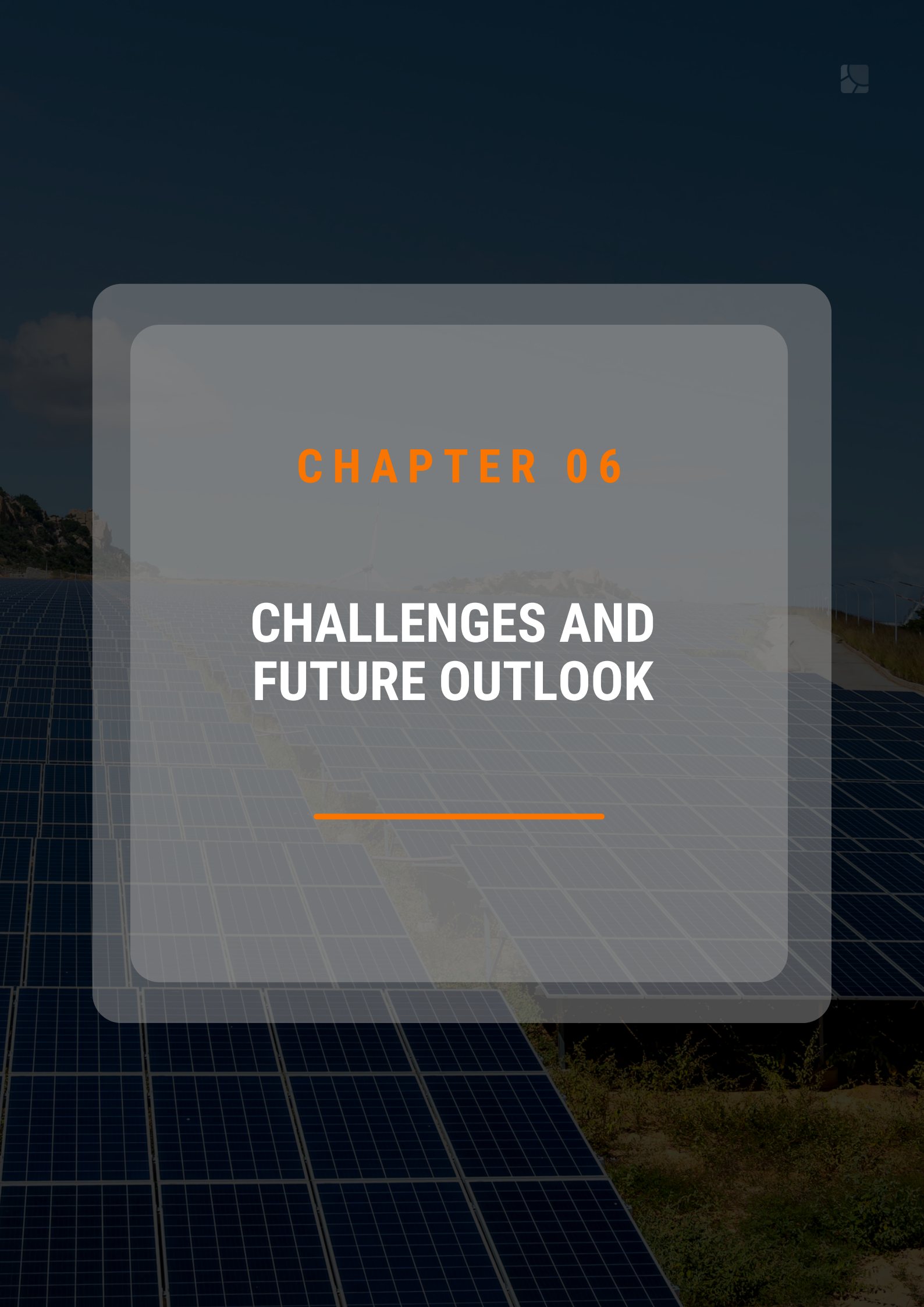


These figures underscore a market that's scaling up quickly, with falling costs and growing demand driven by technology improvements and regulatory clarity.

Socio-Economic Impact of Minigrids

This growth translates into tangible economic and social benefits. Minigrids, by providing reliable and affordable power, enable income-generating opportunities, particularly for lower-income households. They support small businesses and can power essential services like vaccine refrigeration or school computers, contributing to poverty alleviation, improved education, and gender equality. The increased deployment of distributed generation also contributes to job creation and stimulates economic activity through investments in infrastructure.

The observable market response, characterized by increased private sector engagement and measurable growth in installed capacity, clearly validates the efficacy of the regulatory reforms. This demonstrates that the policy shifts have directly translated into tangible outcomes. Furthermore, the impact extends beyond mere electrification. The improved reliability and increased capacity provided by minigrids support a wider range of productive uses of energy, fostering broader socio-economic development within communities, rather than simply providing basic lighting. This focus on productive use is crucial for the long-term sustainability and developmental impact of minigrid projects.



CHAPTER 06

CHALLENGES AND FUTURE OUTLOOK

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While South Africa has made significant strides in reforming its electricity sector and unlocking minigrid deployment, several challenges persist, and the future trajectory requires continuous adaptation and strategic focus.

Remaining Challenges

Despite major regulatory breakthroughs, key barriers remain that could slow down momentum if not addressed:

Grid Constraints
High-potential renewable regions lack adequate transmission capacity, and bi-directional metering capabilities are limited.

Infrastructure Needs
Modernizing the grid is essential to fully integrate DERs—including accurate metering and digital controls.

Policy Certainty
Investors require long-term clarity. Sudden shifts in regulation risk undermining recent progress.

Persistent Cost Challenges
While CAPEX has declined, minigrid development in Africa remains more expensive than the global average. Improving supply chain logistics and encouraging financial innovation are key.

Funding Bottlenecks
Though pledges exist, the slow disbursement of concessional capital constrains scale. Streamlined financing mechanisms are urgently needed.

Future Trajectory

South Africa is charting a course toward a competitive, reliable, and decentralized energy market. The 2024 Electricity Regulation Amendment Act lays the foundation through unbundling Eskom, independent TSO establishment and open-access trading platform for electricity.

These systemic changes enable minigrids to evolve from isolated pilots to integrated infrastructure, selling excess power and providing stability services to the grid.

"Minigrids are no longer peripheral—they are a cornerstone of modern energy systems."

As the TSO becomes operational and market liberalization deepens, the commercial case for minigrids strengthens. Their flexibility, reliability, and contribution to economic development make them indispensable in a decentralized future.

Strategic Outlook

The ongoing nature of regulatory reform is evident; while significant progress has been achieved, continuous adaptation and proactive addressing of emerging challenges are essential for sustained growth. The energy transition is an evolutionary process, requiring regulators to engage with diverse stakeholders to balance competing interests and formulate regulations that are both effective and equitable. South Africa's experience provides a compelling case study of how reactive policy responses to a crisis can evolve into a proactive, long-term strategy for energy sector transformation.

CONCLUSIONS

The unlocking of minigrid deployment in South Africa can be directly attributed to a series of specific, progressive regulatory adjustments, primarily initiated from 2021. The most impactful of these include:

1. **The increase of the generation licensing threshold from 1MW to 100MW in August 2021:** This immediate relaxation of a significant regulatory barrier dramatically reduced red tape and expedited project development for a wide range of embedded generation projects, including minigrids.
2. **The subsequent complete removal of the licensing requirement for generation facilities of unrestricted capacity in January 2023**: This further streamlined the process, signaling a profound shift towards a market-driven approach and accelerating the pace of private sector-led energy development.
3. **The enactment of the Electricity Regulation Amendment Act in August 2024:** This comprehensive legislation is foundational, aiming to unbundle Eskom's monopoly, establish an independent Transmission System Operator (TSO) to ensure fair grid access, and introduce an open, diversified electricity market. This structural reform fundamentally alters the operating environment, enabling greater competition and private participation crucial for minigrid scalability.

These adjustments were not isolated incidents but rather a phased, adaptive response to South Africa's severe energy crisis. The initial liberalization provided empirical evidence that encouraged deeper, more radical reforms. This evolution signifies a fundamental shift from a restrictive, permission-based regulatory model to one that prioritizes market participation and competition. The establishment of an independent TSO is particularly critical, as it addresses historical challenges related to grid access and integration, thereby enhancing the commercial viability and scalability of minigrids.

Complementary policy measures, such as expanded tax incentives for renewable energy and substantial international financial and technical support, have further de-risked investments and improved the economic attractiveness of minigrid projects. While challenges such as grid constraints and the need for continuous financial innovation remain, the regulatory framework is now significantly more conducive to private sector investment and the accelerated deployment of decentralized energy solutions.

In conclusion, South Africa's experience demonstrates that targeted, progressive regulatory reform, driven by a clear imperative and supported by broader policy mechanisms, can effectively unlock significant private sector investment in critical infrastructure like minigrids. These reforms are not merely facilitating energy access but are fundamentally reshaping the country's energy landscape towards a more resilient, diversified, and sustainable future.

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