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Breaking Barriers, Building Markets

Accelerating a Just Energy Transition through Market Reforms

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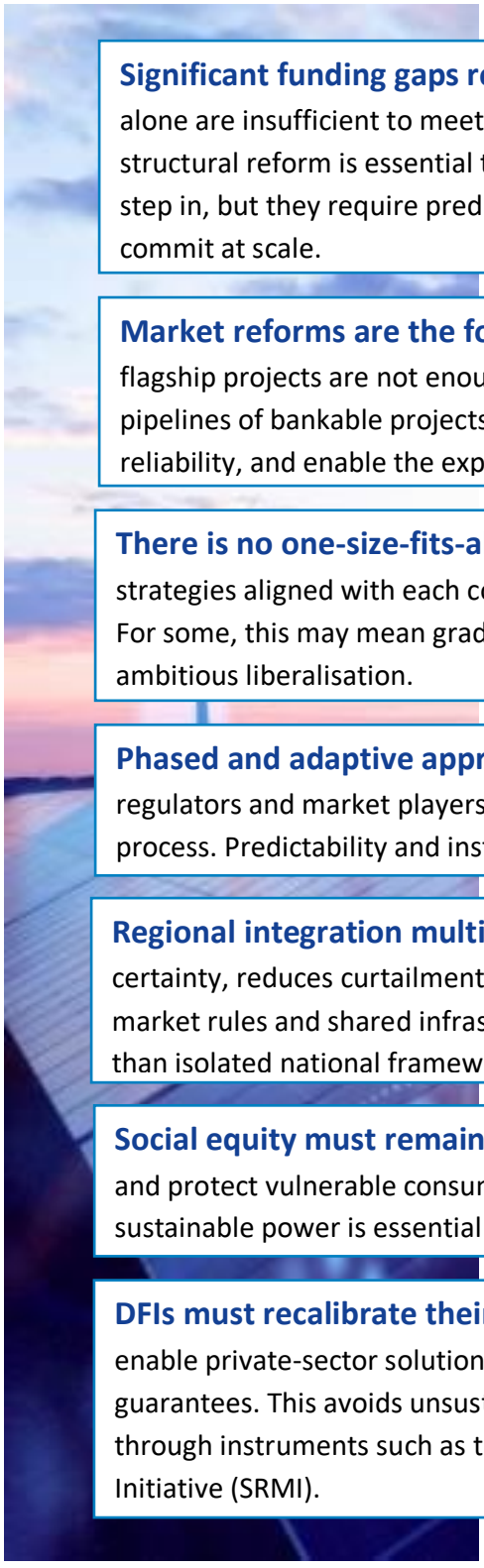
Contents

List of Abbreviations

AfSEM – African Single Electricity Market	MO – Market Operator
ASBM – Advanced Single Buyer Model	MSB – Modified Single Buyer
ATC - Available transfer capacity	NTCSA - National Transmission Company of South Africa
BRP – Balance Responsible Party	PPA – Power Purchase Agreement
C&I – Commerical and Industrial	PPP - Public–Private Partnership
CMP – Continental Master Plan	PV – Photovoltaic
DFI - Development Finance Institutions	RE – Renewable Energy
DSO - Distribution System Operator	RED - Regional Electricity Distributor
EAPP - Eastern Africa Power Pool	REIPPPP - Renewable Energy Independent Power Producer Procurement Programme
EU – European Union	SAPP – Southern African Power Pool
ERB – Energy Regulation Board	SB – Single Buyer
FDI – Foreign Direct Investment	SBM – Single Buyer Model
IEA – International Energy Agency	SO – System Operator
IPP – Independent Power Producer	TSO – Transmission System Operator
LEC – Lesotho Electricity Company	UN – United Nations
LEWA - Lesotho Electricity and Water Authority	

Table of Figures

Key Findings



Significant funding gaps require private capital and reform - Public budgets alone are insufficient to meet energy demand. Unlocking private investment through structural reform is essential to close the financing gap. Private investors are ready to step in, but they require predictable, transparent, and stable market frameworks to commit at scale.

Market reforms are the foundation for long-term energy transition - Isolated flagship projects are not enough. What is needed is a thriving environment that fosters pipelines of bankable projects. Efficient, transparent markets attract capital, improve reliability, and enable the expansion and integration of renewable energy at scale.

There is no one-size-fits-all model - Successful reforms require customized, phased strategies aligned with each country's legal, (socio-) economic, and political environment. For some, this may mean gradual opening and partial competition; for others, more ambitious liberalisation.

Phased and adaptive approaches build confidence - Gradual reforms, give regulators and market players time to adjust, reducing risk and building confidence in the process. Predictability and institutional learning are as important as speed.

Regional integration multiplies benefits - Cross-border trade enhances demand certainty, reduces curtailment of renewables, and stabilises power systems. Harmonised market rules and shared infrastructure create stronger incentives for private investment than isolated national frameworks alone.

Social equity must remain central - Market reforms should safeguard affordability and protect vulnerable consumers. Ensuring that all citizens benefit from reliable, sustainable power is essential for a just transition.

DFIs must recalibrate their role to catalyse private investment - DFIs should enable private-sector solutions over state-owned utilities, using specialised funds and guarantees. This avoids unsustainable models and allows for scalable private participation through instruments such as those under the Sustainable Renewables Risk Mitigation Initiative (SRMI).

1 Power Market Reform in Africa

Access to reliable, affordable, and sustainable energy underpins economic growth, industrialisation, and social development. Across Africa, delivering this goal requires more than building generation capacity. It demands a power sector that can attract large-scale investment, operate efficiently, and deliver power where and when it is needed.

The challenge is stark. Nearly 750 million people worldwide still live without electricity, and 80 percent of them are in Sub-Saharan Africa[1]. Population growth, urbanisation, and industrial expansion are driving electricity demand far beyond current supply. Yet investment in power infrastructure remains insufficient to close the gap. The constraint is not technological, Africa has vast renewable energy potential, but financial and structural. Public budgets are stretched, and without strong institutions, predictable rules, and credible market signals, private capital will continue to stay on the sidelines.

This challenge is matched by an opportunity. Market reform can unlock the investment flows needed for Africa's energy transition. Well-designed frameworks lower costs, reduce risk, and enable competition. They turn isolated projects into pipelines of bankable investments, accelerate renewable integration, and strengthen resilience. Reform also addresses structural barriers that currently block progress: non-cost-reflective tariffs, single-buyer dependence, weak procurement processes, and the limited creditworthiness of utilities.

Transitioning away from vertically integrated monopolies toward more open and decentralised systems is a proven path to unlocking investment. Competitive and transparent markets allow diverse actors, independent power producers (IPPs), corporate buyers, regional traders, to participate and innovate. The result is not only more generation capacity but also better reliability, stronger resilience, and faster progress on both energy access and climate goals.

[1] IEA, World Energy Outlook 2024

The energy transition in Africa must be understood as a system transformation, not simply an accumulation of projects. Installing more solar plants or wind farms is not enough if the underlying market framework cannot integrate them at scale. Reform is an adaptive, long-term process that must be tailored to each national context. Political economy, institutional capacity, and social equity considerations all shape the pathway.

With the right policies, credible regulatory institutions, and mechanisms to attract private capital, Africa can build power markets that drive both electrification and decarbonisation. Regional integration and competitive trade can further expand opportunities, creating economies of scale and more resilient supply systems. The choice is clear: without reform, the electrification gap will widen; with reform, Africa can turn its power sector into a catalyst for inclusive growth, sustainable development, and a just energy transition.

2 Financial Viability of Africa's Power Sector - Aspects for Financing Power Infrastructure Projects

Africa must urgently scale up clean energy investments to meet its growing power demand and climate commitments by 2030. Despite accounting for one-fifth of the world's population, the continent attracts only 3% of global private energy investment and just 2% of global clean energy funding. This severe funding gap threatens progress toward sustainable development, as the power sector grapples with two major challenges: surging demand and a persistent "missing money" problem that undermines financial viability[2].

In Sub-Saharan Africa, power providers often struggle to cover operating costs due to tariff under-pricing, high transmission and distribution losses, and low bill collection rates. Electricity tariffs frequently remain below cost-reflective levels to maintain affordability, positioning state

[2] IEA, Financing Clean Energy in Africa, 2023

utilities as service providers with a dual mandate: to operate an efficient power system while simultaneously fulfilling a broader developmental role. While this approach supports social equity and a just transition, it often results in chronic underfunding, limiting utilities' ability to invest in expansion and maintenance. Furthermore, the absence of transparent and sustainable subsidy mechanisms exacerbates the issue. Many subsidies are poorly tracked, inconsistently allocated, or reliant on unstable funding sources, leading to financial shortfalls, deteriorating infrastructure, and mounting public debt[3][4].

These financial constraints are compounded by high-risk premiums, which drive up capital costs and make investment prohibitively expensive. Regulatory uncertainty further erodes investor confidence, locking the sector in a cycle of underinvestment and slow progress toward universal access.

Addressing these challenges requires various reforms aiming at different angles to attract private investment, reduce dependence on state subsidies, and ensure the long-term financial sustainability of the sector. By implementing clear policy and regulatory frameworks and opening the market to private sector participation, governments can shift the financial burden away from public budgets, freeing up resources for other critical sectors while accelerating Africa's clean energy transition.

2.1 Financing Options for Energy Infrastructure Projects

Developing power infrastructure in Africa requires substantial upfront investment and robust financing mechanisms to mitigate risks and ensure long-term cost recovery. A key consideration is the choice of financing and refinancing models, which determine how projects are structured, who bears financial responsibility, and how risks are managed.

[3] Balabanyan, et al: Utility Performance and Behaviour in Africa Today, 2021
[4] World Bank, Financial Viability of Electricity Sectors in Sub-Saharan Africa, 2016.

In the simplified scheme (Figure 1), the infrastructure developer, whether a state-owned utility (Single Buyer), an IPP, or a Public-Private Partnership (PPP), plays a central role in this process. The developer must secure the necessary funding from diverse sources to cover both project costs (CAPEX and OPEX) and a risk premium. The risk premium is the variable cost component most influenced by the investment environment. It reflects the perceived level of political, regulatory, and market risk and can be reduced through targeted reforms. Lowering this premium is critical to making projects bankable. Risk premium drivers include political and regulatory uncertainty, off-taker creditworthiness, counterparty risk, currency risk, grid and transmission grid and market risk. Higher perceived risk directly translates into more expensive financing[5].

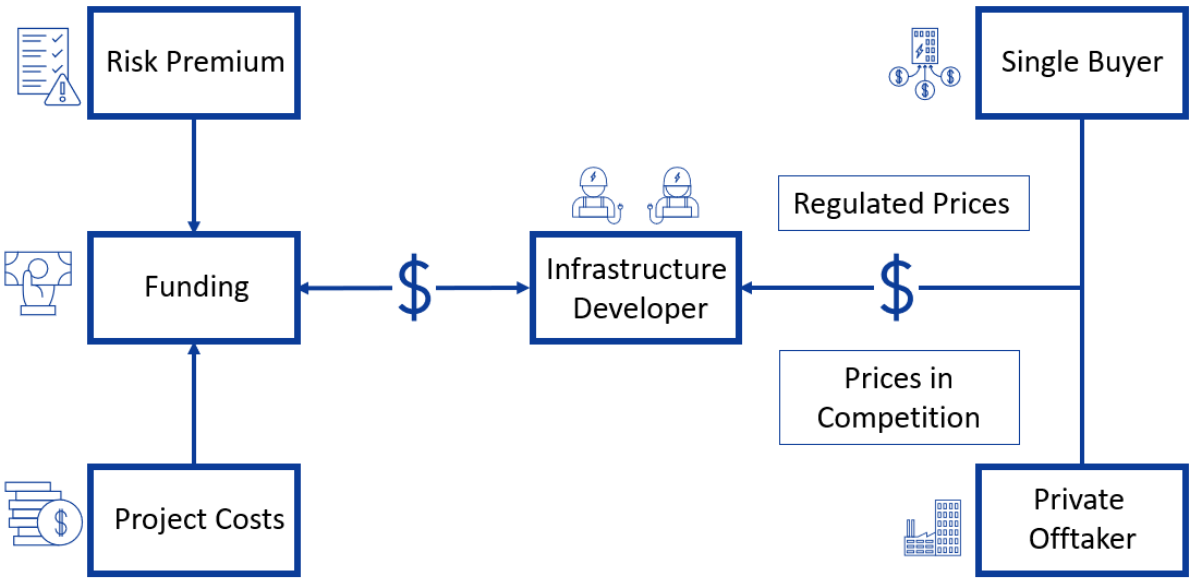


FIGURE 1: SIMPLIFIED PROJECT FINANCING SCHEME

In our simplified approach, there a three different revenue pathways:

[5] Investors assess risks through the concept of the cost of capital, which represents the required return to compensate for investment risks

Regulated prices through a Single Buyer: Power is sold to a sole off-taker, typically a state utility. Tariffs are regulated or subsidised, but the Single Buyer often faces financial distress, delayed payments, or defaults. The high concentration of off-taker risk results in an elevated risk premium and a higher cost of capital.

Prices in competition (diversified off-takers): Power is sold to multiple off-takers such as large industrial consumers, through bilateral contracts, or into competitive market platforms like power pools. Revenue sources are diversified, reducing dependency on a single buyer and spreading credit risk. Lower perceived risk translates into a reduced risk premium and better financing conditions.

Hybrid models: A mix of regulated and competitive sales, for example securing a stable base revenue from a Single Buyer contract while selling a portion of the generated power into competitive markets or to large industrial consumers, through bilateral contracts. This approach can balance revenue certainty with market upside potential, reducing overall project risk while maintaining flexibility.

The selected remuneration model plays a crucial role in shaping the risk premium, as regulatory stability and revenue predictability are key to securing investment and ensuring long-term project viability. Ultimately, whether through regulated tariffs or market-driven pricing, the chosen refinancing strategy directly impacts the financial sustainability of energy infrastructure projects.

Introducing private sector competition in a structured manner helps reduce the risk premium by mitigating financial risks, expanding participation opportunities, and diversifying revenue streams. It can also support the Single Buyer by shifting responsibility for renewable energy expansion to IPPs, reducing the financial burden on public utilities. Moreover, attracting private capital enables governments to reallocate scarce resources to other critical sectors such as healthcare, education, and infrastructure.

Ultimately, the choice between regulated and competitive pricing is not just about tariffs, it determines the cost of finance, the sustainability of the sector, and the speed of Africa's energy transition.

2.2 Key Challenges for Investment and Market Integration

Developing utility-scale renewable power projects in Africa is essential to meet the continent's growing energy and climate ambitions. However, the high capital intensity of such projects, coupled with chronic underfunding of critical infrastructure, poses major challenges. Moreover, the development of power infrastructure in Africa is hindered not only by these financial constraints but also by deep-rooted structural and regulatory obstacles. Many African countries experience an unpredictable investment climate, where unclear, non-bankable regulations and frequent policy shifts undermine investor confidence. These regulatory uncertainties, exacerbated by the absence of clear market structures, complicate project financing and deter long-term commitments from private investors, ultimately limiting the expansion of essential power infrastructure[6].

Structural and regulatory constraints: A lack of clear, bankable regulations and a stable policy environment limits the inflow of capital to finance infrastructure projects. Frequent policy shifts and an absence of coherent market structures create an unpredictable investment climate, underscoring the urgent need for market-friendly reforms.

Creditworthiness of utilities: National utilities and distribution companies often face significant financial instability, which makes them high-risk off-takers for. This risk is exacerbated by the need for government guarantees to underwrite payment

[6] IEA, Financing Clean Energy in Africa, 2023

obligations, guarantees that are often constrained by concerns about debt sustainability[7].

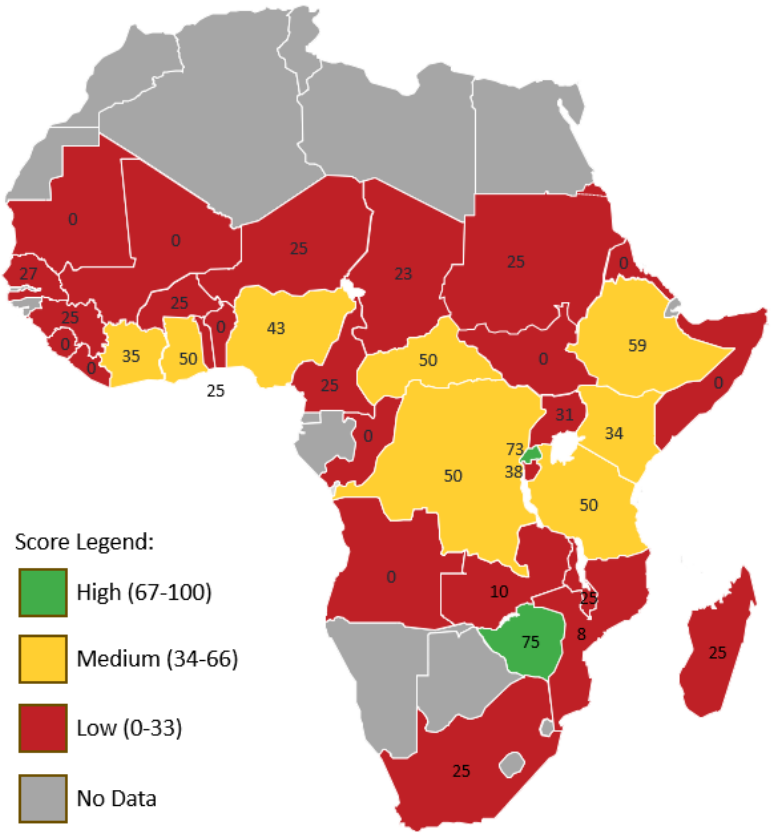


FIGURE 2: CREDITWORTHINESS OF UTILITIES[8]

Non-cost-reflective tariffs: To maintain affordability, many countries set tariffs below levels that accurately reflect the true costs of generation, transmission, and distribution. This practice prevents utilities from generating the reliable revenue streams needed to

[7] IEA, Financing Clean Energy in Africa, 2023
[8] World Bank, ESMAP: Scores | RISE (esmap.org)

over operational expenses, thereby discouraging private investment and exacerbating the funding gap[9].

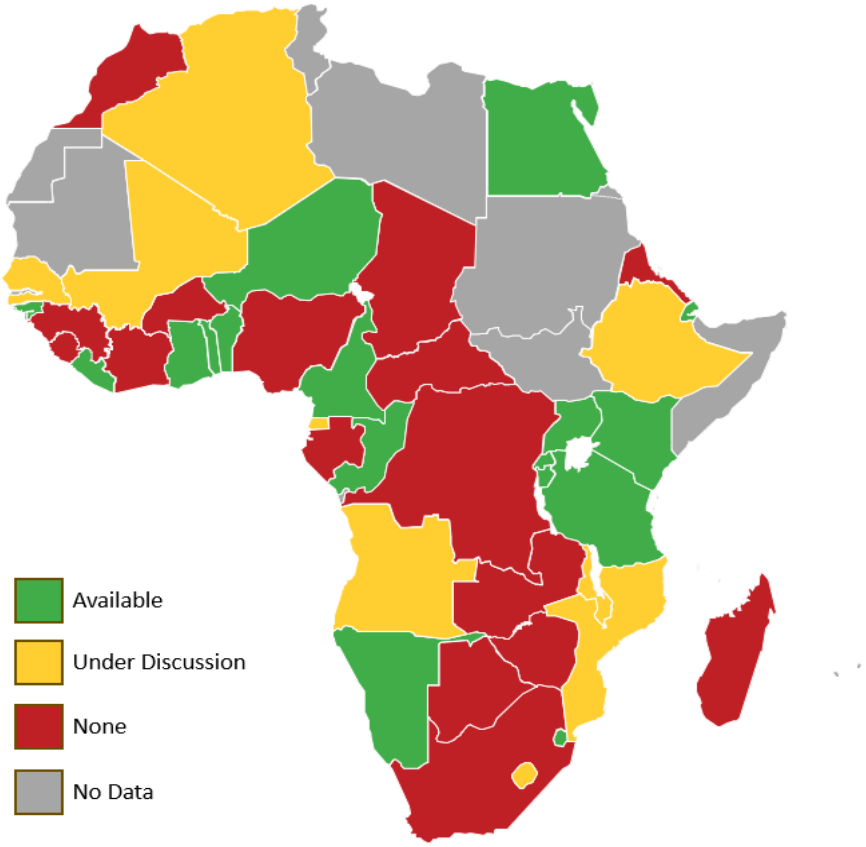


FIGURE 3: COST-REFLECTIVE TARIFF REFORMS[10]

Risk of non-payment and off-taker weakness: Financial instability among state utilities, delays in payments to IPPs, and the overall lack of creditworthy off-takers significantly increase financial risks. These factors make projects less bankable, leading to higher risk premiums and increased costs of capital[11].

[9] Mangaliso & Sacolo, 2019; World Bank, 2016
[10] IEA, Africa Energy Outlook 2022
[11] World Bank UPBEAT - Utility Performance and Behavior Today

These challenges inflate the overall cost of financing, as the market fails to provide the necessary revenue through cost-reflective tariffs. Consequently, utilities must rely on unsustainable government subsidies or bailouts, further compounding the financial burden on the sector.

2.3 From Doubt to Opportunity - Building Trust in Power Sector Reforms

Implementing power sector reforms often raises significant concerns among stakeholders. However, addressing these issues early on is essential for transforming uncertainty into opportunity and building long-term confidence in the reform process.

Affordability: A common fear is that increased private sector involvement could lead to higher tariffs, making power unaffordable for vulnerable customers. To mitigate this, governments can implement tailored measures such as phased tariff adjustments, targeted subsidies, or ring-fenced funding mechanisms (e.g., special purpose vehicles). These tools help ensure that as the market evolves toward greater competition, affordability for low-income households remains protected.

Energy security and control: There is apprehension that market reforms may disrupt power system stability, as seen in some reform attempts where unclear roles and responsibilities led to frequent power outages. A phased, well-communicated approach to reform, coupled with strong regulatory oversight, can safeguard energy security. Clearly defining roles, responsibilities, and performance standards throughout the reform process helps ensure that the transition enhances, rather than undermines, system reliability.

Equity in market access: Another concern is that a shift toward market liberalisation might create a two-tiered system, where wealthier consumers gain access to lower-cost, privately generated power, while poorer households are left with higher prices. To address this, policymakers can introduce legacy cost mechanisms and establish a central market operator to oversee fair pricing practices. This ensures that reforms benefit all consumers equitably, preventing the emergence of an unequal market structure.

By proactively addressing these concerns with well-designed, context-specific strategies, power sector reforms can unlock new opportunities for private investment, technological innovation, and improved service delivery. Transforming stakeholder doubts into confidence is not only crucial for achieving a sustainable, resilient, and competitive power market but also for enabling a just transition that supports economic and social development.

2.4 Unlocking Africa's Energy Future - Key Market Reforms

Africa's power sector holds enormous potential, yet unlocking the necessary investment requires a multifaceted approach that addresses both financial and structural challenges. By implementing comprehensive market reforms and leveraging a diverse array of financial instruments, countries can create an enabling environment that attracts private capital, spurs innovation, and drives the deployment of renewable energy.

Promoting market reforms and fostering innovation: Transitioning from fully government-owned to competitive, more inclusive market structures opens opportunities for private investors. A phased and transparent reform pathway, including the gradual introduction of private off-take through corporate PPAs, peer-to-peer trading, and open access, can build investor confidence. Embedding these reforms into national laws and regulatory frameworks ensures durability and reduces the risk of reversal.

Enhancing regulatory and institutional stability: Clear, consistent policies and robust legal frameworks build investor confidence by establishing well-defined ownership rights and effective contract enforcement mechanisms. Stable governance structures and independent regulatory bodies minimise the risks associated with policy shifts and government intervention, creating a secure and predictable investment climate.

Implementing cost-reflective tariffs: Establishing tariffs that accurately reflect the true costs of energy generation, transmission, and distribution is vital. This approach not only improves the financial health of utilities but also creates a stable environment that encourages IPP participation. At the same time, mechanisms such as ring-fenced subsidy schemes should

protect vulnerable customers, ensuring that affordability concerns are addressed without distorting market signals.

Empowering the system operator and ensuring market transparency: A well-resourced, independent system operator is vital for maintaining system stability, integrating new market participants, and managing the increasing share of variable renewable energy. Transparent market procedures, non-discriminatory power dispatch, and effective imbalance settlement mechanisms build trust in market outcomes and lower transaction risks for investors.

Ensuring transparent and fair grid connection rules: A well-defined and transparent grid connection framework, in transmission and distribution networks, is essential for fostering private sector participation and enabling IPPs to integrate into the power system. To achieve this, clear grid connection guidelines must be in place, ensuring non-discriminatory access to the grid. Standardised procedures, cost-reflective network tariffs, and predictable approval timelines are critical in reducing investment uncertainty and streamlining project development.

Enhancing regional integration: Strengthening cross-border interconnections and creating power pools can help maximise resource use and achieve economies of scale. For IPPs, it opens access to larger and more stable demand centres beyond national borders, reducing market concentration risk and improving revenue certainty. Moreover, regional markets are better equipped to integrate variable renewable energy sources, such as wind and solar, by smoothing fluctuations and facilitating flexible, real-time power exchanges across borders.

Leveraging financial instruments for private investment:

While Africa has access to concessional finance, tax incentives, and guarantees, these tools often remain directed toward governments and state-owned utilities. Private developers face high interest rates and restrictive lending conditions, discouraging project development[12]. Development finance institutions and other lenders should expand targeted risk-sharing

[12]S&P Global: Africa 2024 Credit Ratings Review

facilities, credit enhancements, and concessional loans for private projects within competitive and transparent market frameworks[13]. This would directly lower risk premiums, reduce the cost of capital, and unlock the private investment needed to scale clean energy.

Modernising and expanding grid infrastructure: Long-term grid expansion and modernisation must align with demand growth and renewable integration needs, preventing transmission bottlenecks that slow project deployment. Strengthened grids not only enhance reliability but also provide the backbone for competitive, consumer-focused power markets.

These reforms together highlight the critical role of market restructuring and integration in mobilising private capital. By dismantling monopolistic structures, ensuring transparent and competitive markets, and embedding reforms into stable institutions, African countries can create the conditions for sustained investment, accelerating the continent's transition to a just, sustainable, and economically viable power system.

[13] The Sustainable Renewables Risk Mitigation Initiative (SRMI) by the World Bank is already making progress in this area

3 Power Markets – The Backbone of the Energy Transition

Power markets are at the heart of the energy transition, serving as the dynamic platform that ensures power is produced and consumed in balance. Unlike many other commodities, electricity cannot be easily stored and must be generated in real time to meet immediate demand. This makes it essential for power markets to continuously match supply and demand, coordinating production and consumption every second to ensure a stable and reliable energy supply.

Power markets not only ensure that the right amount of electricity is produced at any given moment but also serve as the primary mechanism for price formation. The interplay of supply and demand determines price signals, which in turn influence both production decisions and consumption behaviours. These signals encourage generators to invest in new capacity and adjust their output based on current needs, while consumers are prompted to optimise their usage and adopt energy-efficient practices.

Moreover, power markets provide an important part of the required framework for integrating a diverse range of energy sources into the power system. This is especially critical for the African continent, where infrastructure challenges, variable demand patterns, and the need for rapid electrification coexist. By accommodating different generation technologies and enabling cross-border trade, modern power markets contribute to building a more resilient, flexible, and competitive energy system that supports sustainable development goals.

As a result, power markets must be designed to reflect the system's physical needs, enabling efficient dispatch and load balancing, while also incentivising investment. Effective market design establishes the right incentives and mechanisms to achieve efficient system operation and advance strategic sector goals, as laid out in policy frameworks and long-term plans. This need has become even more pressing as decarbonisation reshapes priorities, altering traditional concepts of supply security, system reliability, and demand-side participation. The right power market design encompasses the institutional structures, policies, regulations,

market rules, codes, and practices that collectively define market boundaries and determine participant opportunities and incentives.

3.1 Key Roles in the Power Value Chain

The power value chain consists of four key segments: **generation**, where power is produced; **transmission**, managed by Transmission System Operators (TSOs); **distribution**, handled by Distribution System Operators (DSOs); and **sales/retail**, where suppliers purchase and sell power to consumers. Each segment plays a crucial role in ensuring a reliable, efficient, and competitive power market.

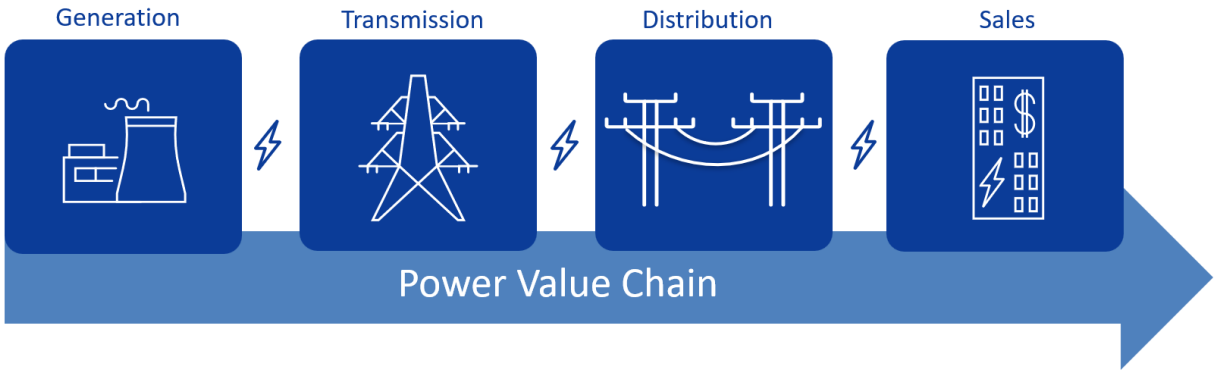
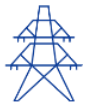


FIGURE 4: POWER VALUE CHAIN

Generation: These entities produce electricity from a variety of sources, ranging from conventional power plants (such as gas & coal) to renewable installations (solar, wind, and geothermal). These entities lay the groundwork for a diversified energy mix that supports both base load and peak demand. Generators can be connected to either the transmission or distribution network, depending on their size and role in the power system.



Transmission: Operators in this segment are responsible for the construction, operation, and maintenance of high-voltage networks. Their role is pivotal in transporting power from generation sites to distribution networks across vast geographical areas, ensuring system reliability and security. In many cases, the System Operator is integrated within the transmission entity, further reinforcing the coordination and security of the power system.

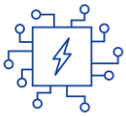
Distribution: Distribution companies manage the local or regional networks that deliver electricity directly to end users. They focus on grid stability, reducing technical losses, and ensuring that communities, businesses, and industries receive a consistent and dependable power supply. In recent decades, the growing adoption of renewable energy, particularly solar PV and small-scale wind, has led to an increasing number of decentralised generation units being connected to distribution networks.

Retail/Sale: Power suppliers purchase power on from generators/wholesale markets and sell it to final consumers. They handle the contractual and commercial aspects of electricity delivery, including billing and customer service, and play a crucial role in ensuring that energy reaches the consumer at fair and transparent prices.

Other Relevant Roles in the Energy Value Chain

Household: Household consumers – Residential users with relatively low but variable power demand.

Major consumers: Large-scale users such as factories, mines or data centres, with high and often stable power demand, directly influencing grid stability and energy market dynamics.



Market Operator (MO): A Market Operator is an entity that administers power trading platforms and oversees market transactions to ensure that supply and demand are balanced efficiently. The Market Operator facilitates competitive bidding, transparent pricing, and fair access to the grid for all participants.

System Operator (SO): The SO ensures real-time power system stability by balancing supply and demand using generator and buyer data. It also manages reserves and ancillary services to maintain continuous system reliability (24/7).

Balancing Responsible Party (BRP): Balance Responsibility is a core principle in many market designs, requiring all entities injecting or withdrawing power to be financially accountable for deviations from their schedules. Typically agreed with the System Operator, this ensures system stability and incentivises accurate forecasting.

Traders: Market participants who facilitate the buying and selling of power in the wholesale arena. Their activities help ensure that price signals accurately reflect the balance of supply and demand, promoting market transparency and efficiency.

Regulator: A regulator is an independent authority or government agency responsible for overseeing market and system operations, ensuring fair competition, enforcing compliance with legal and technical standards, and protecting consumer interests.

Power Pools: A power pool is a cooperative arrangement among several countries or regions that enables power to be traded freely between them. Power pools help balance supply and demand by allowing countries with surplus power to export to those experiencing shortages, thereby reducing the need for expensive backup generation and enhancing overall system reliability.

3.2 Key Market Segments in Power Markets

Power markets are structured into different trading segments, each serving a distinct function:

Future/Forward Market: This segment allows the fundamental market participants (like generators and retail/consumers as well as traders) to enter into long-term contracts, typically weeks, months or years in advance. These contracts help hedge against future price volatility and support investment certainty for power producers as well as price stability for consumers, particularly in markets with growing renewable energy capacity. When implemented as financial markets, these platforms also attract financial traders who trade contracts purely for speculative or hedging purposes, without engaging in physical power generation or consumption.

Spot Market: Short-term physical power trading takes place here, where power is bought and sold for near-immediate delivery. This normally includes:

Day-Ahead Market: Transactions are settled one day before physical delivery, allowing for better scheduling and optimisation of generation assets. This is particularly important in power systems with a high share of renewables, where generation forecasts improve closer to real-time. Markets are usually structured as auctions that determine a common market clearing price based on supply and demand.

Intraday Market: Power trading continues throughout the delivery day, enabling market participants to respond dynamically to unexpected fluctuations in generation or demand. This market plays a crucial role in integrating variable renewable energy sources like wind and solar. Intraday trading may be organised via continuous trading (24/7) or discrete hourly auctions.

Balancing Market: Operated by the SO, this market ensures real-time system stability. When imbalances occur, the SO procures up- or down-regulation energy from BRPs through a market-based mechanism. These actions help maintain grid frequency and secure reliable system operation, particularly during unexpected deviations in demand or supply.

Ancillary and reserve markets/mechanisms: These are markets that provide system services such as short-term reserves for Instantaneous, Regulating, and Ten-Minute Reserves, frequency control, voltage regulation, and black-start capability. These markets allow power system operators to procure ancillary services to maintain grid stability, which is increasingly important with the growing penetration of variable renewable energy.

Imbalance settlement: A vital element of market design, imbalance settlement functions as a distinct financial mechanism that reconciles each BRP's scheduled commitments with their actual metered performance. Deviations are settled at the imbalance price, which reflects the SO's cost of correction. This creates a strong incentive for accurate forecasting and operational discipline across all market stages.

It should be noted that these distinct market segments primarily exist in liberalised power markets. In many parts of Africa and other regions where markets remain less liberalised, such segmentation is not yet fully developed, with many utilities managing these functions internally.

4 Strengthening Utilities – Stages of Reforms

Power market reforms play a crucial role in fostering investment incentives, strengthening investor confidence, and driving the energy transition. By opening markets to competition and private sector participation, these reforms help unlock capital for much-needed infrastructure

investments, accelerate the deployment of renewable energy, improve service reliability, and ensure that markets efficiently respond to consumer needs.

4.1 Unbundling - a Path to Reform or a Risky Gamble

Unbundling is often presented as a silver bullet for transforming utilities and power markets; however, its implementation is far from one-size-fits-all. In many regions, including Africa, unbundling and other market reforms have varying implications, and past experiences have shown that poorly executed reforms can lead to unintended consequences, such as market inefficiencies and reduced energy security.

While unbundling is typically seen as a step toward a more competitive power market, the optimal degree and pace of reform depend on a country's specific (socio-)economic, regulatory, and political context. A tailor-made process, guided by a comprehensive needs assessment, clear regulatory guidance, and an effective communication strategy, is essential to determine whether full, partial, or even no unbundling is the most appropriate path. This ensures that reforms are designed to maximise benefits, minimise disruption, and align with local market conditions and strategic objectives.

Ultimately, when pursued alongside broader market reforms, unbundling can foster investment, enhance efficiency, and support the transition to a more sustainable and resilient power sector that better serves consumers.

4.2 The Role of Unbundling

Unbundling can be a critical step in transitioning from vertically integrated monopolies to competitive power markets. By separating the different segments of the power value chain, generation, transmission, distribution, and retail, unbundling promotes market efficiency, transparency, and fair competition. This process not only enhances operational performance but also improves financial outcomes by isolating risks and increasing the creditworthiness of individual market entities. Although privatisation is frequently mentioned alongside deregulation and unbundling, it is not a goal in itself nor a prerequisite for successful reform.

In many liberalised markets, major companies remain publicly owned; however, targeted privatisation can serve as an effective tool to attract private capital or enhance efficiency when integrated within a broader reform strategy. The main objectives of unbundling include:

Facilitating regulatory oversight: By creating distinct market segments, unbundling enables regulators to enforce rules more effectively, ensuring that each segment operates efficiently and transparently. This establishes a robust regulatory framework that underpins a competitive power market.

Enhancing investment incentives: Independent and transparent market structures reduce barriers for new entrants, particularly in renewable energy generation. This attracts private investment and ensures that capital flows to the most efficient projects.

Strengthening investor confidence: Clear separation of market functions minimises conflicts of interest and reduces regulatory uncertainty. Transparent pricing mechanisms and independent oversight provide the assurance investors need to commit capital to new projects.

Enhancing creditworthiness: Segregating assets allows for a more precise assessment of individual risk profiles. By distinguishing high-performing assets from underperforming ones, overall credit ratings can improve, which in turn lowers the cost of financing.

Boosting renewable energy integration: Competitive markets can better prioritise cost-effective renewable resources such as wind and solar. Independent grid operators facilitate fair and open access, promoting the integration of renewables into the power mix.

Improving service reliability: Encouraging competition in generation and distribution drives operational efficiencies that result in more reliable and affordable power supply for consumers.

The pivotal role of unbundling in creating a dynamic, competitive, and financially robust power market, one that can better serve consumers and support the sustainable expansion of renewable energy.

4.3 Types of (Un)-bundling

Power market restructuring and utility unbundling constitute a critical evolution in the organisation of the power sector, aimed at fostering enhanced investment incentives, improving operational efficiency and transparency.

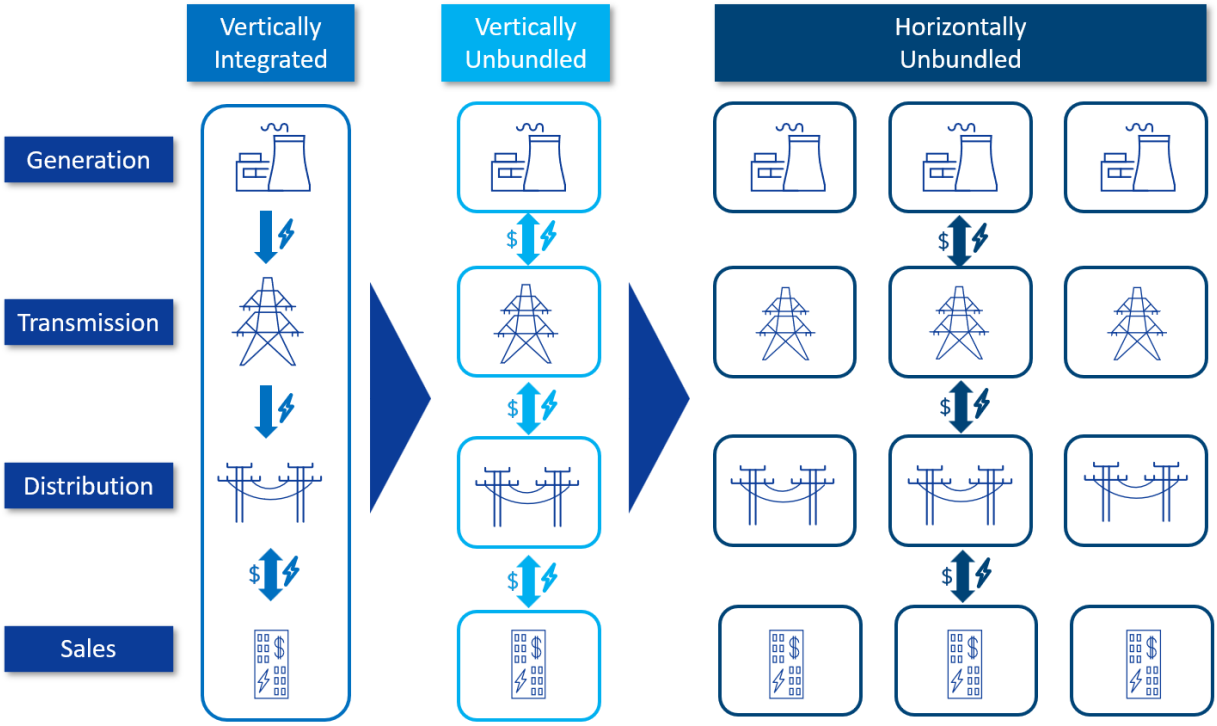


FIGURE 5: VERTICAL AND HORIZONTAL UNBUNDLING

Vertically Integrated: In a vertically integrated utility, a single entity owns and controls the entire power value chain (generation, transmission, distribution, and sales/retail). This structure, while enabling centralised control, often results in inefficiencies, limited

transparency, and barriers to competition. Because one entity governs both infrastructure and market access, new entrants encounter significant challenges, and investment incentives are frequently misaligned.

Vertically Unbundled: Vertical unbundling addresses these issues by separating the various functions into distinct entities for generation, transmission, distribution, and sales/retail. By dismantling monopolistic structures, vertical unbundling reduces conflicts of interest, enhances transparency, and permits independent regulation of each segment. However, if the newly formed entities remain under state ownership, inefficiencies may persist due to continued reliance on government funding and the absence of competitive pressures. Consequently, vertical unbundling is often complemented by market-oriented reforms that introduce private sector participation, typically beginning with IPPs in the generation sector.

Horizontal Unbundled: Horizontal unbundling takes the reform process a step further by fostering competition within individual segments. This approach is most evident in the generation and retail sectors, where multiple companies operate independently, competing to offer superior pricing and services. In retail markets, such unbundling empowers consumers to select their power supplier, thereby creating incentives for lower costs, improved customer service, and innovative pricing strategies. Similarly, in the generation sector, competition among various producers promotes efficiency, drives investment in new capacity, and facilitates the integration of renewable energy sources.

4.4 Components of Unbundling

The unbundling process unfolds through a series of components, each representing a different level of separation and independence, from internal financial segregation to full privatisation. These components are cumulative and must be considered sequentially to ensure a smooth transition from a vertically integrated utility to a competitive market structure.

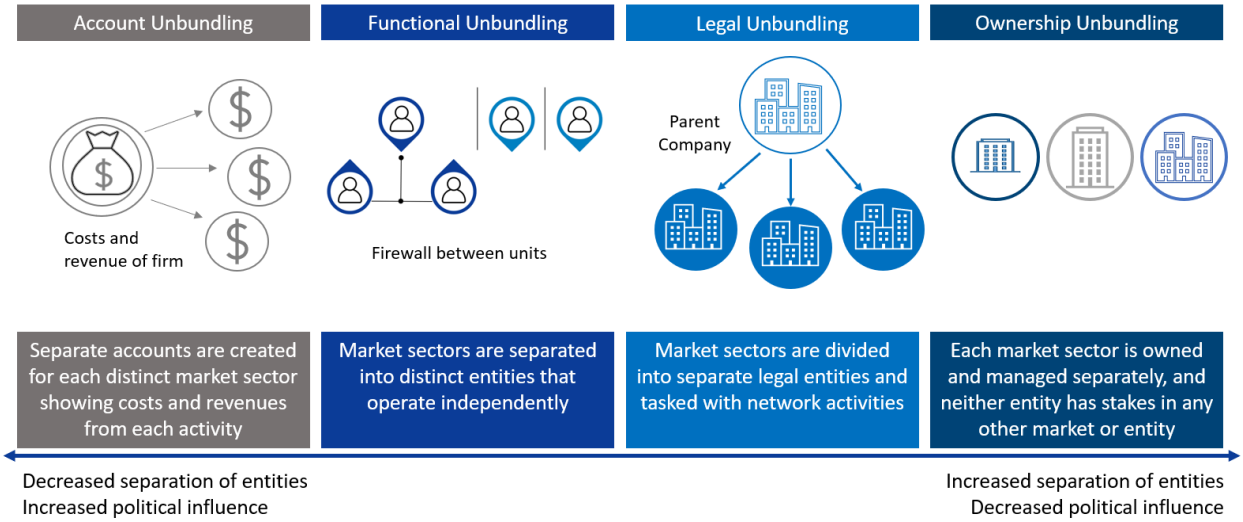


FIGURE 6: COMPONENTS OF UNBUNDLING

Account Unbundling: Account unbundling is the initial step in the disaggregation process, often referred to as "ringfencing". It requires the creation of separate financial accounts for each sector, typically generation, transmission, and distribution, to delineate the costs and revenues associated with each function. This segregation provides greater transparency and lays the financial groundwork for subsequent stages.

Functional Unbundling: Functional unbundling, another form of "ringfencing", involves reorganising the operational and business-related tasks within the utility so that each segment, generation, transmission, and distribution, operates independently. This stage aims to realign operational departments, often requiring the establishment of internal "firewalls" to prevent the intermingling of functions that could compromise independence.

Legal Unbundling: Legal unbundling formalises the separation achieved through accounting and functional reforms by establishing distinct legal entities for each segment of the power value chain. This step is essential for creating clear operational and regulatory boundaries. However, when these legally separate entities remain under a common parent company, there may still be a perception of unified control. To

address this, strong governance measures, such as independent board composition, transparent reporting structures, and oversight mechanisms, are crucial to ensure operational autonomy and maintain market confidence.

Ownership Unbundling: Ownership unbundling represents the final and most comprehensive stage of the process, where the distinct entities are transferred to private ownership. This phase removes the direct political influence inherent in state-owned utilities and fully aligns the market with competitive, corporate management practices.

5 Power Market Reform – More Market, More Possibilities

Building on the previous discussion of utility (un)bundling, this chapter looks at the broader spectrum of power market reform: the gradual opening of power sectors to competition and private investment. While unbundling aims to separate the various functions of a vertically integrated utility, power market reform goes a step further by introducing market mechanisms that encourage multiple participants to generate and sell power. As African countries seek more reliable, affordable and sustainable power, greater market openness can unlock new investment opportunities, foster innovation and improve overall efficiency.

The overview of market stages presented in this chapter provides a simplified framework focusing on the main actors in the power value chain. In practice, market structures are much more complex and nuanced, involving multiple actors such as market operators, system operators, traders and regulators. This high-level overview serves to illustrate how market design stages can be clustered and how market reforms and unbundling interact, highlighting potential pathways towards more competitive and transparent power markets.

Market reform should not be seen as a rigid sequence where every country must aim for full liberalisation. Instead, it is a continuous and adaptive process that must align with national conditions, institutional capacity, and political priorities. These models should therefore be understood less as rigid steps on a linear path and more as reference points that illustrate common features, opportunities, and challenges.

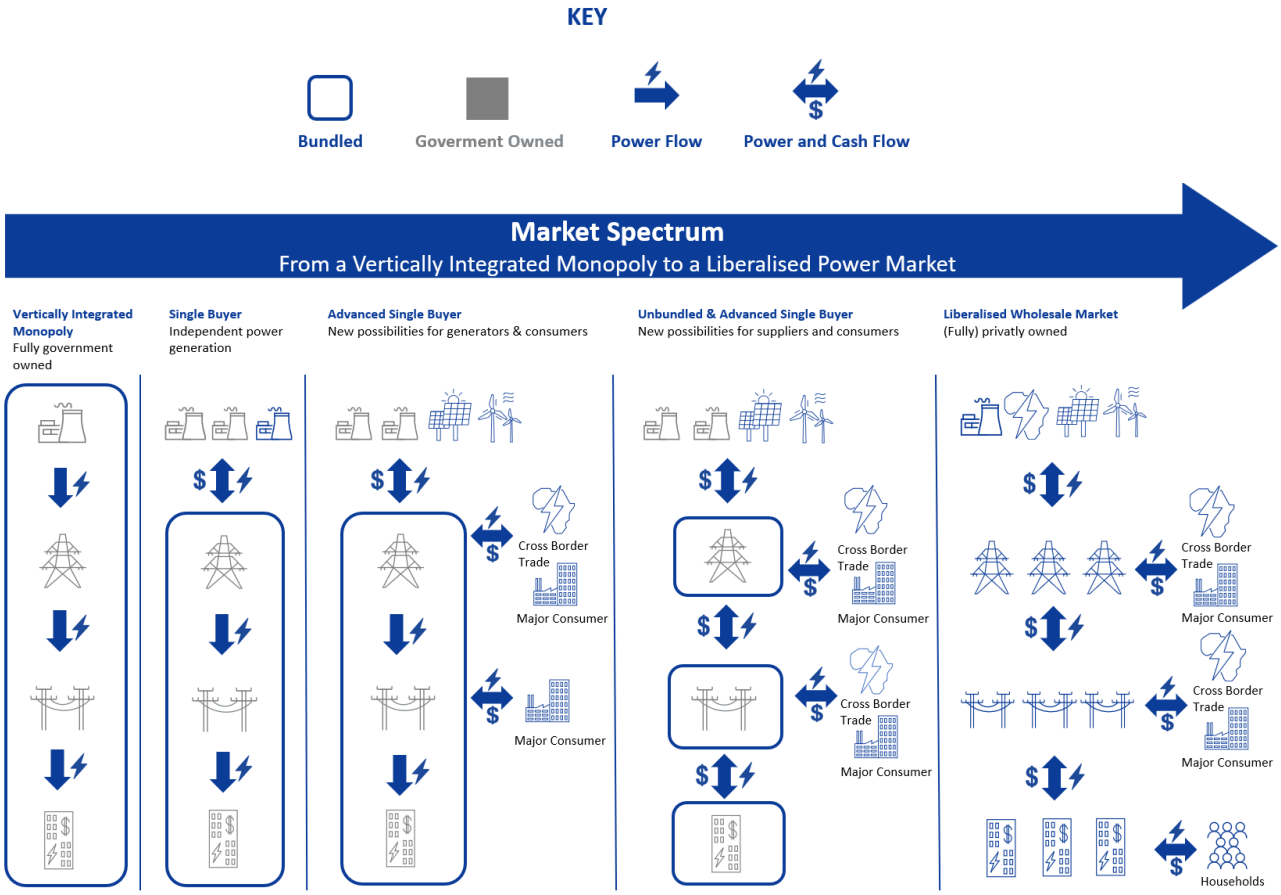


FIGURE 7: SIMPLIFIED POWER MARKET DESIGN STRUCTURES

5.1 Vertically Integrated Monopoly - Fully Government-Owned

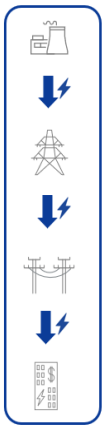


FIGURE 8: VERTICALLY INTEGRATED MONOPOLY

In this model, a state-owned utility manages every segment of the power value chain: generation, transmission, distribution, and sales/retail. The government entity procures all power and sells it to consumers under regulated (often non–cost-reflective) tariffs.

Opportunities:

- **Centralised coordination:** Simplifies planning and decision-making, aligning energy policies with broader national development goals.
- **Clear policy control:** Direct government oversight can support social objectives such as rural electrification and affordable tariffs.

Challenges:

- **Limited competition:** Monopolistic control often leads to inefficiencies, underinvestment, and slower adoption of new technologies.
- **Financial burden:** A single state-owned buyer may face capital constraints and high debt levels, increasing fiscal risks and limiting system expansion.
- **Less transparency:** It is often difficult to determine how costs are allocated across the value chain, making it hard to assess the efficiency of each segment and to understand the true drivers behind end-user tariffs.

5.2 Single Buyer – Independent Power Generation

In this model, the state-owned utility remains the exclusive purchaser of power, but IPPs are permitted to generate power and sell it to the utility under long-term PPAs.

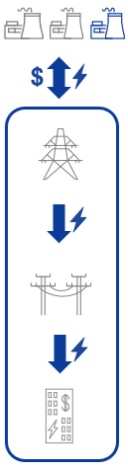


FIGURE 9: SINGLE BUYER - INDEPENDENT GENERATION

Opportunities:

- **Private sector investment**: IPPs bring in additional capital and technical expertise, easing the financial burden on the government.
- **Stable offtake:** Long-term PPAs offer predictable revenue streams for IPPs, which can lower financing costs.

Challenges:

- **Continued monopoly control:** The single buyer retains market access control, which may limit broader competition and influence tariff structures. This market concentration can create systemic risks.

- **Limited portfolio diversification & off-taker risk:** Reliance on a single off-taker can restrict remuneration opportunities, making further investments less attractive.
- **PPA risks:** Poorly negotiated contracts can impose long-term liabilities on either the government or the IPPs (or both).

5.3 Advanced Single Buyer – Introducing Competition

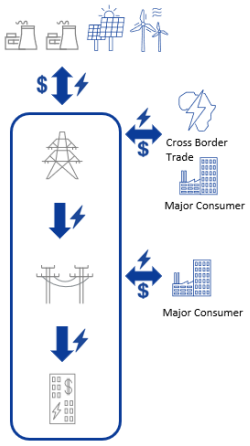


FIGURE 10: ADVANCED SINGLE BUYER

In this model, market access is introduced gradually. While a central Single Buyer remains, IPPs are granted the ability to sell a portion of their generated power directly to large consumers or export markets through cross-border trading. Meanwhile, the state utility continues to serve as the default off-taker and the market operator. This arrangement enhances market flexibility and competitiveness by reducing dependence on a single off-taker.

Opportunities:

- **Enhanced flexibility:** Direct negotiations between IPPs and large consumers promote competitive pricing and more efficient resource allocation.
- **Diversified revenue streams:** Multiple sales channels reduce IPPs' reliance on a single purchaser, thereby lowering investment risks, enhancing profitability and drive costs down.
- **Promotion of renewable energy expansion:** This model fosters renewable energy expansion by attracting private capital, reducing reliance on government subsidies and funds, and freeing up investments for other sectors.
- **Enhanced consumer outcomes:** Large industrial and commercial consumers benefit by gaining access to verifiable clean energy sources, enabling them to meet Environmental, Social, and Governance

commitments and demonstrate alignment with Corporate Social Responsibility goals.

Challenges:

- **Regulatory complexity**: Managing a variety of contract types and ensuring partial open access requires robust legal and regulatory frameworks.
- **Conflict of interest:** The single buyer may continue to own generation and retail assets while also acting as the market operator, creating potential conflicts in overseeing competitors such as IPPs or major consumers. This dual role can undermine market neutrality and investor confidence.
- **Persistent partial monopoly**: Smaller consumers may still have limited choices if they remain tied to the single buyer.

5.4 Advanced Single Buyer - Vertically Unbundled

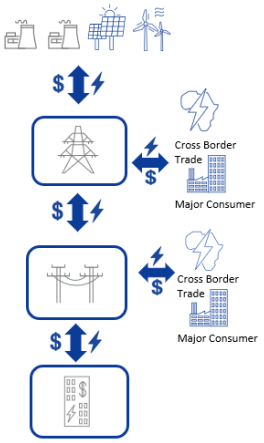


FIGURE 11: ADVANCED SINGLE BUYER – UNBUNDLED

This stage builds on the advanced single buyer model by additionally separating the utility's generation, transmission, and distribution functions into distinct legal or corporate entities. This enhanced structure fosters partial competition in both generation and retail while retaining the benefits of a central buyer framework and addresses the issue of conflict of interest.

Opportunities:

- **Increased transparency and accountability:** Segregating utility functions clarifies costs and reduces conflicts of interest.

- **Improved regulation:** Independent regulation of each segment can drive efficiency, bolster grid reliability, and enhance investment incentives.

Challenges:

- **High implementation costs:** The legal, administrative, and operational restructuring required for vertical unbundling can be substantial.
- **Partial state ownership:** If unbundled entities remain under government control, the full benefits of competition may not be realised unless further privatisation is pursued.

5.5 Liberalised Wholesale Market

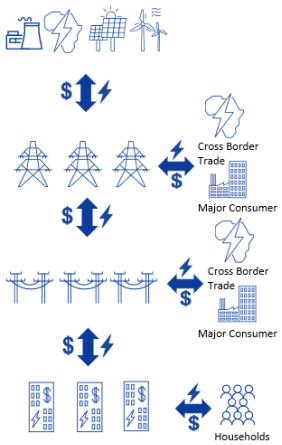


FIGURE 12: FULLY LIBERALISED WHOLESALE MARKET

In the most advanced stage, the market is open to multiple buyers and sellers, with competition governing generation and retail sectors. Although transmission and distribution still remain regulated as natural monopolies due to their infrastructural nature, the competitive forces in generation and retail drive overall market performance.

Opportunities:

- **Robust competition:** Multiple market participants encourage cost efficiency, spur innovation, and enhance consumer choice, potentially lowering prices over time.
- **Transparent pricing:** Competitive bidding and active spot markets help reveal the true cost of generation, thereby guiding effective investment decisions.
- **Renewable generation expansion:** The fully liberalised framework attracts private investment, which is crucial for expanding renewable

energy capacity without overreliance on government subsidies, freeing up resources for other sectors.

Challenges:

- **Stringent regulatory oversight and market monitoring:** A fully liberalised market requires comprehensive regulation to prevent market manipulation, maintain system reliability, and protect consumers from price volatility.
- **Potential market volatility:** Increased competition can lead to sharp price fluctuations, which may pose risks for both producers and consumers.

5.6 More Openness, Less Risk - Expanding Business Potential Through Market Reform

As power markets evolve from vertically integrated monopolies toward fully liberalised wholesale markets, the structure and diversity of business opportunities change fundamentally. In closed systems dominated by a Single Buyer, investment channels are narrow, project bankability depends heavily on government-backed power purchase agreements, and off-taker risk is concentrated in a single entity. This concentration not only limits the range of viable business models but also drives up the risk premium, making government guarantees essential to secure financing.

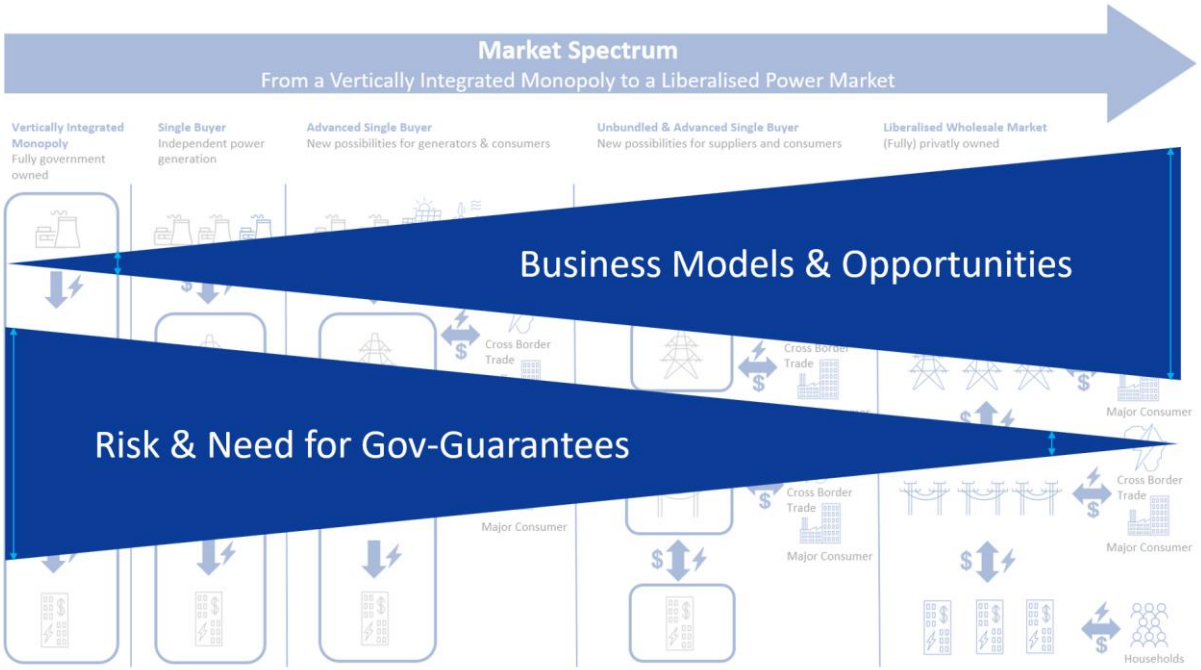


FIGURE 13: MARKET OPENNESS VS. RISK

In more open market structures, such as advanced Single Buyer models with partial unbundling, or fully liberalised wholesale markets, the range of commercial opportunities expands significantly. Independent power producers can sell to multiple off-takers, including industrial customers, retailers, and through competitive exchanges. This diversification reduces dependency on one buyer, spreads credit risk, and improves revenue certainty.

As markets transform, the need for direct government guarantees declines. Competitive market pricing, transparent grid access, and diversified off-takers lower perceived risk, which in turn reduces financing costs. This shift enables governments to redirect scarce fiscal resources toward strategic infrastructure investments rather than underwriting individual projects. In mature wholesale markets, investment decisions are increasingly driven by market signals rather than administrative allocation, fostering innovation, efficiency, and private capital mobilisation.

5.7 Navigating Power Sector Reforms

There is no single market design that can be applied universally. Power market reform is a country-specific process shaped by local economic conditions, institutional capacity, infrastructure readiness, and political priorities. The path from a vertically integrated utility to a competitive retail market is rarely linear. It is an iterative, phased process in which countries advance at different speeds and may choose different end points depending on their policy objectives and resource base.

Some countries may remain in a Single Buyer model for years, while others move more quickly toward wholesale or retail competition. Progress requires strong institutions, transparent regulation, and active stakeholder engagement. In many cases, reforms are sequenced to allow the system operator, regulators, and market participants to build the capacity needed for more advanced market structures.

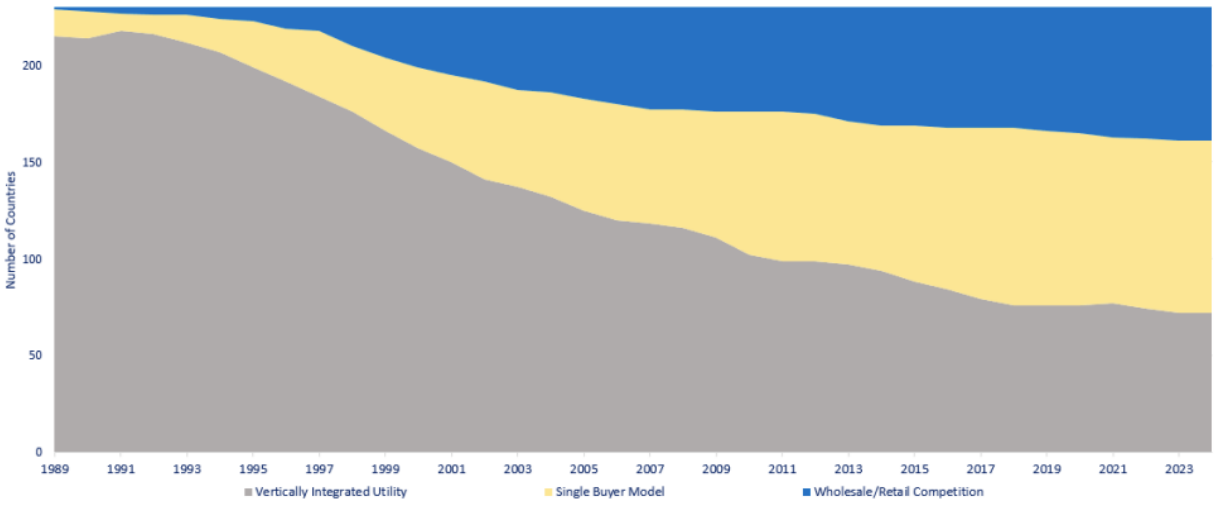


FIGURE 14: GLOBAL MARKET DESIGN DEVELOPMENTS[14]

Globally, the direction of travel is clear: the number of countries with vertically integrated utilities has steadily declined, while wholesale and retail competition has expanded. This shift

[14] Akcura & Mutambatsere, Global Evolution of Power Market Designs, World Bank, 2024

reflects growing recognition that competitive frameworks can improve efficiency, attract investment, and enable greater private sector participation.

For African countries, the lesson is twofold: reforms should be tailored to local realities, and each step must be designed to strengthen system stability, electrification goals, investor confidence, and social acceptance.

6 Power Market Design in Africa – Market Reforms in Motion

Creating an effective power market is essential for nations striving to achieve reliable, affordable, and sustainable energy. However, there is no one-size-fits-all approach to power market design. Each country in Africa has unique economic conditions, regulatory landscapes, and infrastructure capabilities that shape its market structure. A well-functioning power market requires a tailored approach that aligns with local realities while ensuring efficient power generation, transmission, distribution, and trade.

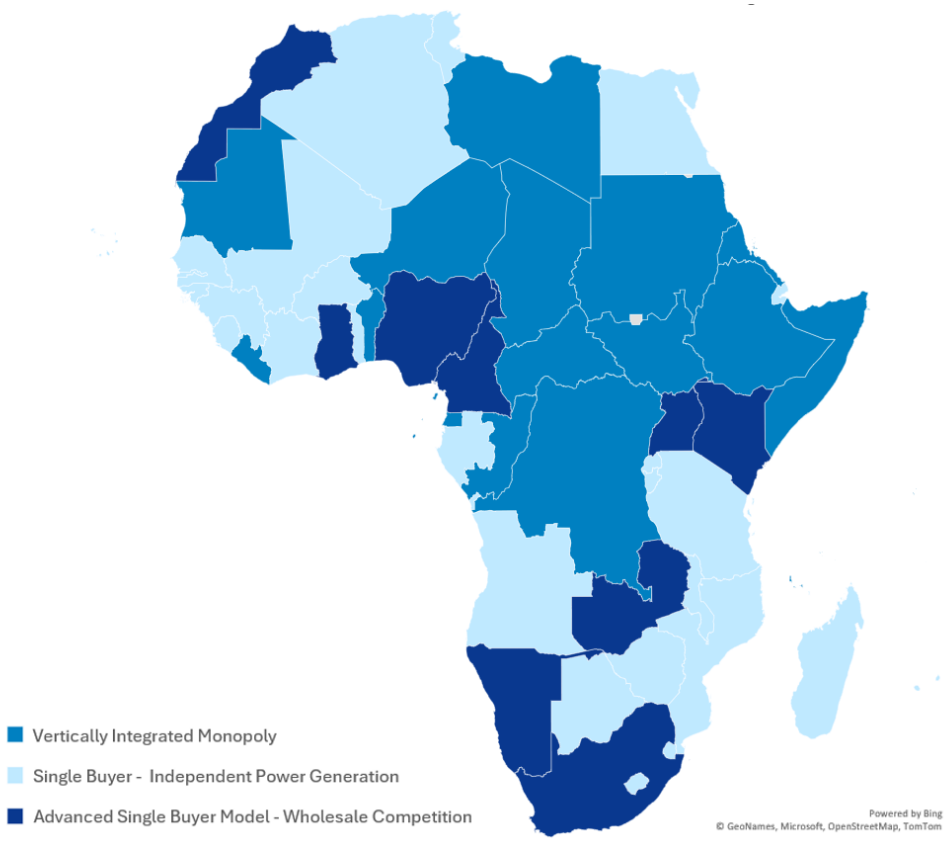


FIGURE 15: OVERVIEW OF POWER MARKET MODELS IN AFRICA (AS OF 2024)[15]

[15] World Bank, Global power market structures & Power Market Knowledge Product by Christoph Kellermann

Across Africa, power markets are evolving through various stages of reform. Many countries are transitioning from vertically integrated, state-controlled utilities toward market structures that introduce competition and private sector participation. While some nations maintain a Vertically Integrated Single Buyer model, others have adopted a Single Buyer framework where private generators can participate and sell power to the utility. Namibia's Modified Single Buyer model, Zambia's Open Access regime, and South Africa's vertically unbundled Advanced Single Buyer model, which is steadily evolving into a multi-market framework, exemplify the growing diversity of approaches. These emerging models are broadening market participation, fostering competition, and improving efficiency. South Africa, in particular, is advancing towards a liberalised power market, paving the way for greater flexibility and consumer choice.

In parallel, other countries like Uganda, Zimbabwe, and Mozambique are currently also undertaking important regulatory changes to promote private sector participation, enhance market transparency, and lay the groundwork for more flexible and investor-friendly electricity markets.

This chapter explores the current state and developments of power market designs across Africa, analysing ongoing reforms, key challenges, and future pathways for market evolution. It focuses on the Single Buyer Model with a case study from Lesotho, the Advanced Single Buyer market structures in Namibia and Zambia, and the Unbundled Advanced Single Buyer Model in South Africa, highlighting key lessons and impacts from these diverse approaches.

6.1 Single Buyer – Independent Generation

Single Buyer models remain dominant in Africa. Traditionally, these models featured solely government-owned generation projects; however, there has been a shift toward incorporating private sector participation. Under these revised models, IPPs are allowed to generate power, while the single buyer continues to serve as the sole off-taker. A prime example of this approach in action is Lesotho, where a well-functioning vertically integrated Single Buyer model with active IPP participation has contributed to a more competitive and efficient power market.

Key regulatory building blocks in such market structures may include:

Legal and policy enablement - Establish a clear legal foundation that formally allows private sector participation in power generation. This includes defining the rights, roles, and responsibilities of IPPs, the Single Buyer, and other stakeholders to minimise regulatory uncertainty and investor risk.

Transparent licensing and procurement - Introduce non-discriminatory licensing frameworks to ensure fair market entry for IPPs. Complement this with standardised, transparent procurement mechanisms, such as competitive tenders or well-regulated direct negotiations, to promote efficiency and credibility in project selection.

Bankable contracts and risk mitigation - Develop standardised, investment-grade PPAs with clear risk allocation, addressing key concerns such as payment security, currency fluctuation, and termination terms. Consider incorporating government guarantees or credit enhancement mechanisms to strengthen off-taker bankability.

Independent regulation and oversight – Empower an independent regulatory authority with a well-defined mandate to oversee tariff setting, licensing, compliance, and dispute resolution. Strong regulatory governance enhances transparency and long-term market stability.

Integrated planning and system coordination - Involve the system operator or relevant utility in long-term system planning to ensure IPP integration aligns with national least-cost expansion plans and grid capacity. This coordination helps prevent network congestion and stranded investments.

Case Study: Lesotho

Lesotho, a mountainous country in Southern Africa, has long relied on power imports from South Africa's Eskom to meet its growing demand. Despite local generation efforts, only around 50% of the population has access to power, underscoring the need for greater investment in generation capacity and infrastructure. To achieve universal, affordable, and sustainable power access, Lesotho has embarked on policy and regulatory reforms aimed at reducing reliance on imports, diversifying energy sources, particularly renewables, and attracting private sector participation. These reforms focus on creating a conducive environment for IPPs to generate and sell power within a Single Buyer framework, laying the foundation for a more resilient and self-sufficient power market.

Regulatory Reforms

Over the past few years, Lesotho has enacted several reforms to open its power market to private sector involvement. Under the Single Buyer Model, the Lesotho Electricity Company acts as the sole off-taker, purchasing power from both public and private entities. Key elements include:

Authorised IPP participation: Recent regulations permit IPPs to build generation facilities and sell power to LEC through PPAs.

Streamlined licensing: Revised procedures reduce administrative hurdles and uncertainty for new renewable projects, encouraging investments in solar PV and wind farms.

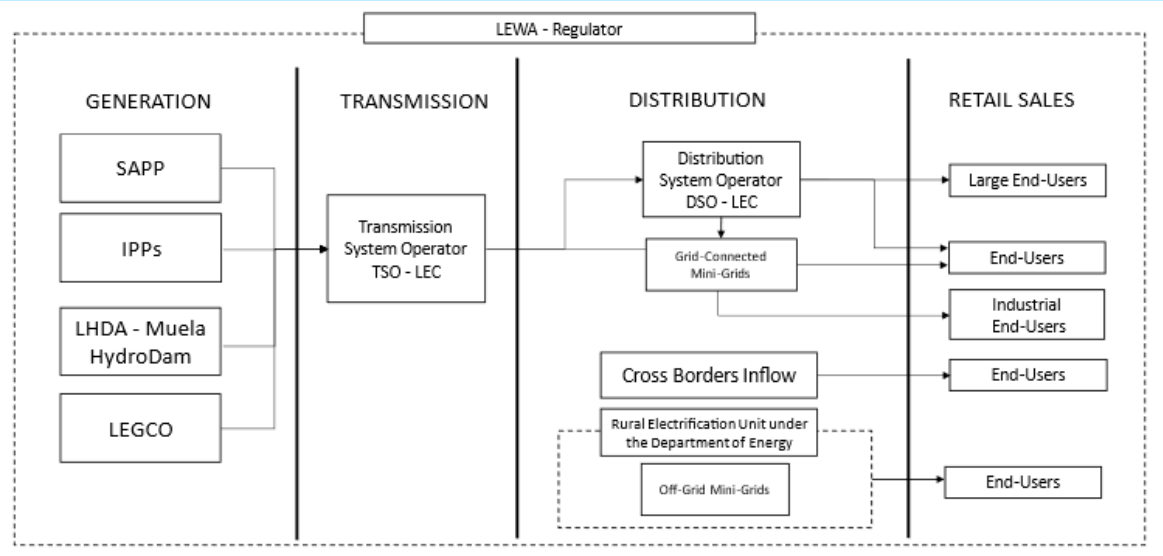


Figure 16: Lesotho market design[1]

Impact & Future Outlook

Lesotho's evolving Single Buyer Model has generated significant private sector interest, with more than 200 MW of new renewable projects in various stages of planning and development. By expanding domestic generation capacity and preparing for future surplus exports via a trading office within LEC, Lesotho is on track to improve power security, lower import dependence, and boost power access for its population.

As the country continues to refine its Single Buyer framework and incorporate more IPPs, it moves closer to achieving the broader objectives set out in its energy policy, namely, reliable and affordable power for all, economic growth through job creation in the energy sector, and environmental sustainability through the use of clean, locally sourced resources.

6.2 Advanced Single Buyer – Wholesale Competition

The concrete market design under an advanced single buyer model is highly dependent on country-specific market rules and regulatory frameworks. While the simplified model provides a useful overview, actual market structures are more sophisticated and layered.

In practice, the advanced Single Buyer model can accommodate a range of market mechanisms, from allowing bilateral trades under long-term power purchase agreements PPAs to enabling competition with options for cross-border power trading. The specific regulatory approach must be carefully tailored to each country's economic and regulatory environment.

Key regulatory building blocks in such market structures may include:

Phased market evolution: Power market reforms often follow a phased approach, gradually expanding market access, allowing for adjustments over time and a better and more ordered way to adjust to the new market environment.

Partial market opening: IPPs may be allowed to sell a portion of their generated power directly to large industrial consumers or other off-takers. Costumers may be permitted to procure a portion of their energy demand directly from IPPs. Over time, market access can be incrementally expanded, starting at the transmission level before extending to distribution-level customers.

Institutional enhancements: Establishing dedicated market institutions, such as a Market Operator, System Operator, and National Trader, to facilitate competition and ensure transparent market operations.

Regulatory and tariff oversight - Strong and independent regulatory oversight ensures market transparency, protects consumers, and prevents abuse of market power. Cost-reflective tariffs and non-discriminatory wheeling fees are essential to enable fair competition and grid access

Regional market integration: IPPs and traders may be allowed to participate in regional power markets, enhancing cross-border trade, improving asset utilisation, and supporting regional energy security. This also expands revenue opportunities for local generators and reinforces harmonised standards.

Introduction of new markets: Developing and implementing new markets, such as a Day-Ahead Market and an Intraday Market, can support dynamic price formation, improves short-term efficiency, and enhances overall market competitiveness.

Grid access and connection guidelines - Standardised procedures for project connection and capacity allocation help streamline the entry of IPPs and manage grid constraints. This includes technical standards, connection timelines, and mechanisms for prioritising projects when capacity is limited.

Namibia has been a frontrunner in power market reforms, progressively introducing competition and enhancing market attractiveness. Similarly, Zambia has pursued a reform path that allows direct bilateral trade between producers and large consumers, expanding the range of available market mechanisms.

These examples highlight that advanced market designs are evolving across different regions, demonstrating diverse approaches to market reforms. However, successful implementation must be carefully tailored to each country's unique economic and regulatory environment, ensuring alignment with local market conditions and policy objectives.

Case Study: The Modified Single Buyer (MSB) Model in Namibia

Namibia's transition to the MSB model marks a crucial step in unlocking private sector investment, fostering competition, and expanding renewable energy in its power market. Previously, Namibia operated under a single-buyer model, where NamPower, the state-owned utility acted as the central market player. This centralised structure restricted IPPs from directly participating, discouraging investment and limiting the diversification of the energy mix, particularly in integrating renewables. It also increased Namibia's reliance on coal-powered electricity imports from South Africa.

To address these challenges, Namibia introduced the MSB model in 2019 to enhance market competition, attract private investment, and strengthen energy independence by expanding renewable energy generation and reducing reliance on imports. Prior to this reform, IPP participation had been permitted through feed-in tariffs, which proved expensive, and competitive auctions, which delivered only limited results. Some IPPs had also entered into direct off-take agreements with Regional Electricity Distributors (REDs), despite the absence of a formal regulatory framework. The MSB model provided the much-needed clarity and structure to formalise these practices, laying the foundation for a more transparent, competitive, and efficient power market. However, transitioning to this new framework required extensive regulatory reforms to create a well-governed market environment that ensures investment security, fosters competition, and supports reliable power supply.

The Modified Single Buyer Model

The MSB model is being implemented in phases, ensuring an orderly transition that allows market participants to adapt to new conditions, while regulators monitor and refine the framework over time. The phased rollout also helps mitigate risks by gradually expanding market participation in a controlled manner.

Phase 1a: 2019–2021 (Transmission level)

The first step of liberalisation targeted transmission-connected customers and regional exports:

- Large transmission customers were allowed to procure up to 30% of their demand directly from eligible generators.
- IPPs gained the right to export power and participate in the Southern African Power Pool (SAPP), opening opportunities for cross-border sales under the MSB framework.

Phase 1b: 2021–2026 (Expansion to distribution level)

The second step expanded participation to distribution level and introduced market intermediaries:

- Licensed traders were permitted to operate within the domestic MSB market, not only in exports.
- Distribution-connected customers could now procure up to 30% of their demand from IPPs or traders.
- The Electricity Control Board was given authority to adjust contestable limits based on market development, allowing greater flexibility over time.

Phase 2: Post-2026

Beyond 2026, the MSB is expected to expand further, introducing more advanced trading mechanisms and widening participation across the market.

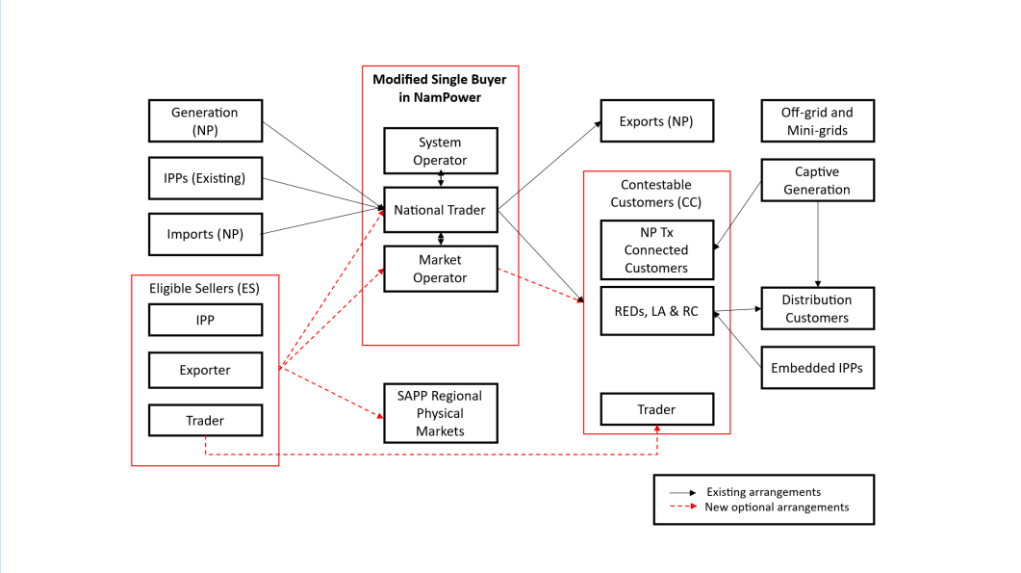


Figure 17: The MSB market structure (Phase 1)[16]

The core objective of the MSB model is to enable IPPs to sell parts of their power directly to large consumers or export into the regional power market, while also granting large consumers greater procurement flexibility. This shift introduces multiple benefits to the power market. Private companies gain more avenues for participation, leading to a more diversified power generation portfolio and increased investment opportunities. Additionally, IPPs benefit from multiple revenue streams, reducing their dependency on a single off-taker (NamPower) and mitigating investment risks.

Impact of the MSB

Namibia's Modified Single Buyer model has lit up the country's power market, turning cautious interest into real megawatts on the ground. Under the MSB framework, 28 MW of solar PV are already feeding the grid, with another 93 MW set to come online next year[17]. This rapid build-out is matched by a surge in market engagement: the promise of direct sales and regional trading has drawn an unprecedented wave of grid connection requests, quickly surpassing available capacity.

The response has been so strong that 79 generation licences have already been issued, and new grid connection guidelines, are now in place to ensure capacity is allocated efficiently and projects are integrated smoothly. These rules not only streamline the process but also maximise the value of each new connection, critical for a country with limited grid capacity but vast renewable potential.

The MSB is more than a national reform; it is becoming a continental reference point. It shows how a well-sequenced, market-driven opening can attract private capital, diversify off-take, and reduce financing risk without compromising grid stability. For African markets looking to move beyond single-buyer dependence, Namibia offers proof that competition, if introduced with discipline, can scale renewables, strengthen security of supply, and plug countries into the opportunities of regional power trade.

By keeping reforms adaptive and anchored in sound regulation, Namibia is not just securing its own energy future. It is helping shape the blueprint for a more dynamic, interconnected African power market.

[16] ECB, MSB Guide, 2023
[17] Mining & Energy, 2025

6.3 Vertically Unbundled Advanced Single Buyer - Wholesale Competition

Advanced single buyer models with vertical unbundling represent an evolution from traditional state-dominated systems by legally separating generation, transmission, and distribution functions. In South Africa, this approach has enabled the incorporation of private sector participation while maintaining a central off-taker for legacy contracts. The market design is highly country-specific, ranging from simple bilateral PPAs to fully competitive arrangements with cross-border trading possibilities. South Africa's experience illustrates how vertical unbundling can enhance transparency, regulatory oversight, and investment incentives, offering valuable insights into the complexities of modernising power markets in Africa.

Beyond the core elements of an Advanced Single Buyer model, regulatory building blocks towards an unbundled Advanced Single Buyer model can include:

Phased market evolution: Adopt a step-by-step approach to market liberalisation, gradually introducing competition while preserving system reliability. Phased reforms help market participants adjust, reduce transition risks, and provide regulators time to fine-tune the framework.

Institutional enhancements: Establishing specialised entities such as independent system and market operators, fostering transparency, efficiency, and accountability in market operations.

Legal unbundling of entities: Legally separate generation, transmission, distribution, and market operation roles to prevent conflicts of interest, enable fair market access, and improve regulatory oversight. Unbundling also facilitates the entry of new players and diversification of services.

Expanded market structures: Introduce new market segments (e.g., day-ahead, balancing, ancillary services) to increase operational flexibility and support more dynamic, competitive pricing. Allowing bilateral contracts, trading platforms, and regional power exchanges enhances liquidity and cross-border integration.

Strengthening market oversight: Implementing clear governance structures, ensuring robust regulatory enforcement, and preventing market distortions that could undermine competition.

Cost-reflective tariffs & retail competition: Introducing transparent, market-based pricing mechanisms to promote investment certainty, efficient resource allocation, and consumer choice.

Case Study: South Africa's Market Reform – Power Sector Reform & Unbundling

South Africa's power sector has been undergoing a significant transformation over the past two decades, moving from a state-controlled, vertically integrated system towards a more open and competitive market. This shift has been driven by the urgent need to address persistent load shedding, alleviate Eskom's financial crisis, and reduce the government's burden in maintaining the sector. At the same time, the transition aligns with the country's broader goals of diversifying its energy mix and accelerating the shift toward clean energy.

The transition has been structured in phases, beginning in the late 1990s and now entering Phase III, which seeks to expand private sector participation, improve service reliability.

Phase I: Initial Liberalisation Efforts (1998–2006)

The first phase of reforms laid the groundwork for market liberalisation. Policymakers sought to introduce customer choice, encourage competition in power generation, and ensure non-discriminatory access to the transmission network. These measures were intended to attract private sector investment and establish a more dynamic electricity market. However, despite these ambitions, progress was slow due to regulatory uncertainty and limited policy follow-through. As a result, Eskom retained its dominant position, and private sector participation remained minimal.

Phase II – Renewable Energy Auctions and Single-Buyer Model (2011–2020)

After several years of stagnation and worsening supply shortages, South Africa launched the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) in 2011. This marked the country's first structured, large-scale effort to diversify its energy mix and bring in private capital, without fundamentally changing the underlying market design.

The programme created bankable PPAs backed by sovereign guarantees, making South Africa a leading destination for renewable energy investment in the region. The Department of Energy acted as the procurement authority, while Eskom remained the sole buyer of power and gatekeeper to the grid. REIPPPP was widely praised for its transparency, standardised documentation, and relatively fast early implementation. Between 2011 and 2022, it awarded more than 11 GW of capacity across multiple bidding windows.

Yet the limits of this model became increasingly clear. Regulatory delays, grid bottlenecks, and Eskom's financial distress slowed project execution. The concentration of off-taker risk in a single utility undermined investor confidence, particularly in later bidding rounds. Developers had no viable alternative if tenders were delayed or contracts withheld, as there was no framework for bilateral trading or retail competition. While REIPPPP successfully established a functioning procurement process and brought renewables into the generation mix at scale, it did not resolve structural constraints or create a self-sustaining, competitive market.

Phase III: Future Market Design: Power Market Transformation -Liberalisation & Unbundling (2021–Present)

South Africa's third phase of power market reform represents the most ambitious step yet toward creating a competitive and decentralised power market. Its foundation is the unbundling of Eskom and the establishment of the National Transmission Company of South

Africa (NTCSA), a legally separate entity tasked with operating the grid, ensuring neutrality, and eventually acting as market operator. This structural change is designed to ring-fence Eskom's dominance, creating the institutional conditions for fair competition and investor confidence.

The reform model is deliberately stepwise and voluntary. Participation in the new Day-Ahead Market will be optional, while bilateral contracts remain central. This hybrid design combines short-term efficiency through transparent price discovery with long-term certainty provided by PPAs. Eskom, through the Central Purchasing Agency (CPA) within the NTCSA, continues to serve as the main off-taker for legacy and auction-based PPAs backed by government guarantees.

A major turning point came in 2021, when the licensing requirement for generation projects up to 100 MW was scrapped, unleashing a surge of private-to-private transactions. This reform enabled large commercial and industrial users to contract power directly from independent producers, driving investment into distributed renewable generation and creating one of the most dynamic growth areas in the sector.

At the regional level, the NTCSA will anchor South Africa's participation in the SAPP. Through a Net Export Curve, it will present South Africa's aggregated supply-demand position as a single bid into the SAPP DAM, ensuring internal system constraints are respected while enabling transparent cross-border trading.

While the Advanced Single-Buyer model remains in partial operation, South Africa is clearly transitioning toward a multi-market structure. Centralised procurement through legacy contracts is now complemented by bilateral agreements and voluntary market participation. The planned launch of a wholesale market in 2026[18] will embed competitive price discovery and flexible contracting, positioning the country for deeper renewable integration, greater reliability, and more sustainable investment flows.

Despite this progress, key structural features remain transitional. Tariffs are still bundled, and Eskom continues to dominate distribution and much of the off-take. However, the phased approach ensures regulatory learning and institutional adaptation over time. By embedding strong ring-fencing, voluntary participation, and regional integration, Phase III establishes the foundation for a multi-market structure. If implemented effectively, this model could combine investment security with competitive efficiency, supporting both South Africa's decarbonisation goals and its role as a central player in the regional power market.

Impact of the Reforms

The transition from Phase II to Phase III in South Africa's power market has marked a fundamental turning point. Whereas Phase II, largely defined by centralised procurement under the REIPPPP, delivered approximately 11 GW[19] at financial close over more than a decade, it struggled to fully meet its implementation targets. A significant share of procured capacity remained unsigned or unbuilt, particularly in later bidding rounds. These delays, along with grid access constraints and regulatory bottlenecks, limited the programme's ability to keep pace with rising demand and the urgency of decarbonisation.

Phase III, in contrast, has ushered in a more dynamic and liberalised power market. Reforms that enabled private generation, removed licensing thresholds, and promoted direct power purchase agreements have unlocked a wave of investment. Since 2021, over 3 GW[20] of renewable capacity has been installed, primarily by IPPs, and a project pipeline of approximately 133 GW is now in various stages of development[21]. This shift has rapidly diversified South Africa's power mix, with wind and solar technologies playing an increasingly central role in the country's generation portfolio.

[18] SAWEM, Road to SAWEM 2026
[19] Power Futures Lab - SA IPP Data, 2024
[20] Power Futures Lab - SA IPP Data, 2024
[21] SAWEA, 2024

The ongoing market reforms are reshaping South Africa's power sector, fostering competition, investment, and efficiency. While these reforms create opportunities, they also present challenges, particularly regarding structural inefficiencies, financial constraints, and governance issues. A competitive wholesale market alone cannot resolve systemic problems such as non-payment and operational inefficiencies. To ensure long-term stability, the reform process must be accompanied by clear transitional measures and government-supported regulatory guardrails. These policy safeguards will be essential to sustaining the momentum of market liberalisation, ensuring energy security, affordability, and renewable integration for all consumers.

7 The Bigger Picture - the Role of Cross-Border Power Trade in Africa's Energy Future

Regional power market integration is a crucial step toward enhancing power security, optimising resource use, and reducing costs through cross-border power trade. By linking national power markets, countries can benefit from shared generation resources, improved grid stability, and more competitive power prices. One key mechanism enabling such integration is the establishment of power pools, structured trading platforms that facilitate coordinated power transactions and grid operations across borders. Such arrangements not only enhance efficiency but can also encourage investors by providing reliable cross-border trade opportunities, where neighbouring markets may serve as off-takers.

7.1 Power Pools and Their Role

A power pool is a cooperative arrangement among multiple countries or regions that enables power to be traded across borders. These pools help balance supply and demand by allowing countries with surplus power to export to those experiencing shortages, thereby reducing the need for expensive backup generation and enhancing overall system reliability. In Africa, institutions like the SAPP and the EAPP exemplify how regional collaboration can drive the energy transition through coordinated power trading. At a continental level, the AfSEM is an emerging concept aimed at harmonising national power markets into a continental power market.

7.2 Market Coupling and Price Harmonisation

A critical step in regional power market integration is market coupling, which links separate power markets through coordinated trading mechanisms. In fully coupled markets, power is traded based on real-time supply and demand conditions across regions, leading to more stable and competitive prices. Market coupling helps narrow price differences between countries by aligning dispatch decisions and ensures that power is dispatched economically. This mechanism

not only facilitates seamless power trade but also provides clear price signals, which are essential for guiding investment decisions.

7.3 Cross-Border Grid Interconnection

Underpinning regional integration is the establishment of interconnected transmission networks that allow power to flow freely across borders. These interconnections enable countries to leverage geographical and seasonal variations in power supply and demand, for example, exporting surplus power from hydropower or wind installations during periods of high generation to regions facing deficits. Well-integrated grids also enhance system resilience by providing alternative supply routes in the event of power plant outages or transmission disruptions. Initiatives like the development of the Continental Master Plan further support these efforts by outlining regional infrastructure investments and cooperative strategies.

7.4 Establishing Regional Power Markets

The transition to a decarbonised and integrated power system depends on the creation of robust regional power markets. These markets must be underpinned by cross-border trading mechanisms and aligned regulatory frameworks that ensure the shared infrastructure is operated efficiently, transparently, and fairly across jurisdictions. Achieving this requires both advanced technical coordination and strong institutional harmonisation.

Well-designed regional markets combine the benefits of bilateral contracting with centralised platforms such as day-ahead or intraday markets, offering both short-term price efficiency and long-term investment security. To function effectively, three key dimensions must be addressed: market structure and trading arrangements, pricing and revenue frameworks, and market access and governance.

7.4.1 Market Structure and Trading Arrangements

Regional integration begins with a clear, rules-based market structure that supports multiple trading models while ensuring fairness and non-discrimination. Key elements include:

Cross-border trading agreements: These formalise the rights and obligations of participating countries, covering scheduling, metering, balancing, and settlement, and guaranteeing equal access to interconnectors for all participants.

Transmission capacity determination: Available transfer capacity (ATC) must be calculated transparently and published ahead of trading intervals, with harmonised methodologies across TSOs. This enables optimal use of interconnections while safeguarding system reliability.

Seamless interfaces between national and regional market: For regional integration to succeed, national markets must interface effectively with the regional framework without requiring full structural realignment. This calls for a shared digital infrastructure, common data protocols, and standardised procedures to ensure interoperability. The goal is to preserve the integrity of national systems while allowing them to fully participate in regional trading platforms.

Ancillary services integration: Cross-border markets require coordinated provision of frequency control, reserves, and voltage support. Regional pooling of ancillary services can reduce costs and improve operational resilience.

By combining structured day-ahead and intraday markets with over-the-counter traded PPAs, regional markets can balance short-term efficiency with long-term investment certainty.

7.4.2 Pricing and Revenue Framework

Efficient cross-border trade depends on transparent price formation and fair revenue distribution. Critical design features include:

Revenue allocation & transmission costs: Transmission revenues from cross-border trades must be shared among TSOs according to agreed methodologies, ensuring cost recovery for interconnector investments while avoiding double-charging.

Congestion management: The ability to manage cross-border power flows transparently and effectively depends on establishing a common methodology for congestion management and capacity allocation. Through harmonised capacity allocation methods, preferably using implicit auctions that integrate capacity allocation into market price formation to ensure electricity flows to where it is most valued

Risk management & dispute resolution: Market participants require clear mechanisms to hedge price and volume risks, including financial transmission rights and forward markets. Regional dispute resolution platforms, ideally under a dedicated market regulator, are essential for handling contractual or operational conflicts swiftly and transparently.

A well-designed pricing and revenue framework ensures that interconnectors are used efficiently, investment incentives are maintained, and market participants operate with confidence.

7.4.3 Market Access and Governance

The credibility of a regional power market rests on clear, harmonised rules and strong institutional oversight:

Market participation: Transparent entry requirements for generators, traders, and large consumers help broaden the market base while safeguarding system stability. To foster efficient and competitive trade, regional power markets must be governed by a coherent set of trading rules. These rules should be regionally focused rather than fragmented along national lines.

Regulatory coordination & harmonisation: To ensure consistency, transparency, and rule enforcement, regional market integration must be supported by a dedicated regional regulatory authority or coordination platform. National regulators must align licensing, grid codes, and market rules to avoid barriers to trade. A regional regulatory body or coordination forum should oversee compliance, enforce common standards, and ensure consistent application of rules across jurisdictions.

Market transparency & monitoring: Continuous publication of market prices, transmission capacities, and system conditions is vital for investor confidence. Monitoring mechanisms must detect and address market manipulation or anti-competitive behaviour.

When these structural, pricing, and governance elements are aligned, regional power markets can evolve from basic cross-border exchanges into fully integrated platforms that optimise resource use, lower system costs, and attract sustained private investment. They provide the institutional backbone for large-scale renewable integration and the long-term stability needed for Africa's energy transition.

7.5 Key Benefits of Regional Power Trade

Regional power trade policies aim to create an integrated, competitive, and sustainable power market across member states. This framework facilitates the seamless production and delivery of power, allowing energy generated in one country to be consumed in another, thereby enhancing energy security and promoting the clean energy transition.

Cost efficiency and cross-border optimisation: Regional power trade allows countries with lower-cost generation to export electricity to higher-cost areas, optimising resource use and reducing average system costs[22]. This optimisation improves price

[22] The EU harmonised power market saves consumers already up to. €34 billion/year – EC, Electricity market, design

signals, encourages efficient dispatch, and delivers cost savings for both utilities and consumers. It also creates opportunities for market participants to earn revenues through efficient cross-border trading.

Expanded off-taker base: Opening access to regional markets enables IPPs to reach a broader customer base beyond their domestic off-taker, including large industrial users and utilities across borders. This diversification reduces market concentration risk, enhances revenue predictability, and significantly improves project bankability, particularly for capital-intensive investments. Regional integration also enables projects to be structured and financed on the basis of cross-border off-take agreements, reducing reliance on local demand or the financial health of a single utility. The added liquidity in a regional market strengthens price signals, lowers transaction risks, and contributes to a more efficient and investor-friendly power market.

Attraction of private sector investment: Transparent, competitive, and regionally coordinated markets create a stable and predictable investment environment. Harmonised regulations and access to larger markets lower entry barriers and attract private capital into generation, storage, and transmission infrastructure.

Enhanced grid stability and resilience: Cross-border interconnections and power pooling provide operational benefits, including increased reserve sharing, smoother load variations, and improved system reliability. This makes power systems more resilient to local shocks or supply disruptions.

Renewable energy integration: A well-integrated regional market enables better use of variable renewable energy. Surplus wind or solar power in one country can be exported to neighbours, reducing curtailment and ensuring clean power is not wasted. This also allows for shared balancing resources and regional flexibility mechanisms.

Consumer empowerment and market access: Advanced market design opens opportunities for large customers and, over time, smaller users to choose their supplier, access competitive pricing, or participate in demand response programs. Clear, enforceable rules enhance consumer protection and market confidence.

Long-term price stability and predictability: By enabling long-term contracts and reducing reliance on short-term market fluctuations, regional power trade can provide more stable pricing for consumers and industries, critical for economic planning and energy affordability.

Regional power market integration represents a major opportunity to enhance power security, efficiency, and affordability. Through the development of interconnected grids, market coupling mechanisms, and power pools countries can achieve a more resilient and sustainable power market. This integrated approach not only supports the transition to renewable energy but also paves the way for a dynamic, competitive, and investor-friendly power sector on both a regional and global scale.

8 Conclusion

Africa's power sector stands at a decisive crossroads. On one side lies the unprecedented opportunity of the energy transition, with new technologies, decentralised business models, and regional trade opening pathways for innovation and participation. On the other side lies an urgent need to mobilise vast amounts of capital to close the continent's electricity access and investment gaps. Public budgets and financially constrained utilities cannot carry this burden alone. The private sector must play a central role, but unlocking its full potential requires predictable, transparent, and bankable market conditions.

Market reform provides a powerful pathway to achieve this. By opening power sectors to greater participation and competition, reform can attract private investment, diversify supply, and improve efficiency. Yet reform is neither a silver bullet nor a uniform process. Simply liberalising markets or unbundling utilities will not, in itself, guarantee success. Market reform must be gradual, context-specific, and aligned with national realities. Each country's path depends on its economic structure, institutional capacity, the maturity of its utilities and regulators, and its political appetite for change.

Successful reform is built on strong foundations: policy clarity, effective and independent institutions, creditworthy off-takers, and secure revenue models. These conditions provide the predictability and confidence investors seek, ensuring that capital flows into sustainable projects rather than remaining on the sidelines. Importantly, reform is not an end state but an ongoing process.

For Africa, the way forward lies in a phased and adaptive approach. Pilot schemes and controlled openings can provide space for innovation while maintaining system stability. Step by step, reforms, whether through competitive procurement, gradually expanding private off-take, or developing regional trading frameworks, allow markets and regulators to adjust, learn, and refine over time. A fully liberalised market may not be the goal for every country. What

matters is that reforms strengthen service delivery, expand access, and attract the private capital required to drive a just and sustainable energy transition.

In conclusion, market reform is both urgent and full of opportunity. If designed with care, sequenced with pragmatism, and grounded in national policy objectives, it can serve as the foundation for a resilient power sector, one that delivers reliable, affordable, and sustainable electricity to all Africans, while enabling the private sector to become a trusted partner in shaping the continent's energy future.

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