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Energy Policy Reform: Bridging the Gap in Energy Potential and Chronic Underperformance in Nigeria

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Abstract

Nigeria's power sector presents a complex paradox of vast energy potential and chronic underperformance. With an estimated demand far exceeding supply, the nation has long relied on a centralized, inefficient grid and expensive, polluting backup generators. This paper analyzes Nigeria's historical energy policy, from the failed privatization efforts under the Electric Power Sector Reform Act (EPSRA) of 2005 to the transformative provisions of the new Electricity Act 2023. We argue that the failures of past reforms were rooted in a persistent liquidity crisis, an outdated centralized grid, and systemic governance issues. The study examines how the new Electricity Act's provisions for decentralization and state-level electricity markets offer a strategic opportunity to bypass these bottlenecks. By empowering states and promoting off-grid renewable energy solutions, the Act can attract crucial private investment, address the energy access gap, and foster a more inclusive and reliable power supply. Drawing on global case studies, this paper proposes actionable policy recommendations to leverage this new legal framework for a sustainable and equitable energy future for Nigeria.

Keywords

Energy Policy Reform; Energy Potential; Chronic Underperformance; Nigeria

1. Introduction

Nigeria's power sector has long been a paradoxical narrative of immense potential juxtaposed against chronic underperformance. Despite being Africa's largest economy and possessing vast natural gas reserves, the nation's electricity grid is severely constrained, consistently failing to meet an estimated demand of over 30,000 MW [1]. This persistent deficit has far-reaching socio-economic consequences, stifling industrial growth, elevating the cost of doing business, and embedding energy poverty within the national fabric. The reliance on expensive and polluting fossil fuel generators for self-generation has become a default for households and businesses, with a recent survey revealing that over 70% of Nigerian consumers depend on alternative power sources due to the unreliability of the grid [2, 3]. This systemic failure has not only constrained the country's Gross Domestic Product (GDP) but has also undermined public health, environmental sustainability, and the achievement of the Sustainable Development Goals (SDGs) [3].

The historical trajectory of Nigeria's power sector is a study in centralized governance and the shortcomings of a monopolistic structure. The nationalization of electricity provision under the Power Holding Company of Nigeria (PHCN) created a system that was financially insolvent, technically inefficient, and largely unresponsive to

consumer needs. While the Electric Power Sector Reform Act of 2005 (EPSRA) was a landmark effort to privatize and unbundle the sector, it fell short of its promise. The reforms failed to fundamentally alter the underlying issues, leaving a privatized but still-centralized market that was plagued by a perpetual liquidity crisis, a massive metering gap, and regulatory inconsistencies [4, 5]. The subsequent years saw minimal private investment and a continued degradation of infrastructure, culminating in a sector teetering on the brink of collapse.

However, a new and transformative chapter has been initiated with the enactment of the Electricity Act 2023. This landmark legislation represents a paradigm shift, as it devolves significant powers from the federal government to sub-national entities, allowing states, companies, and individuals to engage in the generation, transmission, and distribution of electricity. This decentralization aims to circumvent the bottlenecks of the national grid and foster localized, competitive electricity markets. The Act's provisions for renewable energy, rural electrification, and a more robust regulatory framework position it as a critical opportunity to address Nigeria's power deficit from a new, more inclusive perspective. It is against this backdrop of historical failure and nascent reform that this paper seeks to provide a comprehensive analysis of the opportunities for policy reform to catalyze steady supply and equitable utilization of electricity in Nigeria. The study was guided by the following objectives:

(1) Analyze the core challenges contributing to Nigeria's persistent power supply deficit from a multi-faceted perspective (operational, financial, and regulatory).

(2) Evaluate the provisions of the Electricity Act 2023 as a strategic policy reform aimed at decentralizing the power sector.

(3) Identify and examine key opportunities presented by the new legal framework to foster inclusive energy utilization and ensure a steady supply, particularly through off-grid and renewable energy solutions.

(4) Propose a set of actionable policy recommendations that leverage the new reforms to unlock private investment and address the energy access gap.

2. Review of Related Literature

The discourse on Nigeria's power sector is extensive, spanning decades of scholarly and institutional analysis. This literature review is structured to trace the evolution of the sector's challenges and contextualize the promise of the new Electricity Act within both national and global contexts.

2.1 The Evolution of Nigeria's Power Sector Policy

The literature broadly categorizes Nigeria's power sector history into three phases: the pre-privatization era, the EPSRA-driven privatization phase, and the emerging decentralized phase under the Electricity Act 2023. Early works often focused on the inefficiencies of the state-owned monopoly, highlighting the lack of maintenance, poor governance, and chronic underinvestment that led to a national grid in disrepair [6, 7]. The EPSRA of 2005 was widely heralded as a necessary reform, but its implementation revealed significant flaws. Some studies had meticulously documented the post-privatization challenges, noting that while private companies were introduced, they were saddled with a legacy of debt, a non-cost-reflective tariff system, and a centralized regulatory framework that stifled true market competition [8, 9]. The failure of privatization to deliver on its promise of a steady power supply has been a recurring theme, leading to widespread public disillusionment and a persistent liquidity crisis [10].

2.1.1 The Quest for Light: A Comprehensive Analysis of Energy Policy Reform in Nigeria

Nigeria, a nation endowed with abundant energy resources, including over 200 trillion cubic feet of proven natural gas reserves and vast solar and hydro potential, has paradoxically remained a nation plagued by a persistent and debilitating power deficit [11]. For decades, the lack of a stable and reliable electricity supply has been a critical bottleneck to economic development, stifling industrial growth, escalating the cost of doing business, and hindering the socio-economic advancement of its teeming population. The pervasive use of private fossil fuel generators—often referred to as "I-pass-my-neighbor"—is not merely a lifestyle choice but a testament to the chronic failure of successive energy policies to meet the nation's power needs.

The history of Nigeria's power sector is a journey from a government-owned monopoly to a liberalized market that, for a long time, failed to deliver on its promise. The story begins with the National Electric Power Authority (NEPA), created in 1972 from the merger of the Electricity Corporation of Nigeria (ECN) and the Niger Dams Authority (NDA). NEPA was a vertically integrated public utility that controlled all aspects of the power value chain: generation, transmission, and distribution. As a state-run entity, NEPA was plagued by the common ailments

of public corporations in developing economies: pervasive bureaucracy, chronic underfunding, and political interference [12]. The organization became notoriously inefficient, earning it the ironic moniker, "Never Expect Power Always." Despite vast investments, NEPA's generating capacity and service delivery dwindled, leading to a situation where the nation's power output was a mere fraction of its installed capacity.

By the late 1990s, with a return to democratic rule, the dire state of the power sector became a central focus of government policy. The prevailing global trend of privatization, championed by institutions like the World Bank and the IMF, provided the ideological framework for Nigeria's first major policy shift. This culminated in the National Electric Power Policy (NEPP) of 2001 and, subsequently, the Electric Power Sector Reform Act (EPSRA) of 2005. The EPSRA was a landmark piece of legislation designed to dismantle the NEPA monopoly. It led to the creation of the Power Holding Company of Nigeria (PHCN), which was then unbundled into 18 successor companies: six generation companies (GenCos), one transmission company (TCN), and eleven distribution companies (DisCos). The ultimate goal was to privatize these companies and usher in a new era of private sector-led efficiency and investment.

2.1.2 Objectives and Targets of the EPSRA 2005

The EPSRA 2005 was built on a foundation of ambitious objectives and clear targets, all aimed at a fundamental transformation of the sector. The key objectives were:

(1) To create a transparent and competitive electricity market: By unbundling the monopoly, the government sought to introduce competition among power generators and distributors to drive efficiency and lower costs.

(2) To attract private sector investment: The privatization of GenCos and DisCos was intended to draw in both local and foreign private capital, thereby alleviating the government's financial burden and injecting much-needed funds for infrastructure development.

(3) To ensure a system of generation, transmission, and distribution that is efficient, safe, affordable, and cost-effective.

(4) To increase the nation's total electricity supply and improve its reliability to meet the socio-economic development needs of the country.

(5) To establish a strong and independent regulatory body, the Nigerian Electricity Regulatory Commission (NERC), to oversee the market, protect consumer interests, and ensure a level playing field.

The targets were equally bold. The National Electric Power Policy of 2001 had set an ambitious goal of reaching universal access to electricity by 2030, a target that was seen as a key driver for the entire reform process [13].

2.1.3 The Strengths and Gaps of the Post-2005 Reforms

While the EPSRA was a necessary and important step, its implementation and subsequent performance revealed significant strengths but also critical, ultimately debilitating gaps.

The EPSRA successfully created a legal and institutional framework for a privatized market. The establishment of NERC provided a semblance of regulatory authority where none existed before. The unbundling of PHCN, while challenging, was a monumental task that laid the groundwork for a market structure, which was a necessary prerequisite for private sector involvement.

The privatization in 2013 did attract initial private capital, with major Nigerian and foreign investors acquiring stakes in the GenCos and DisCos. This infusion of private capital, though modest, was a clear achievement in a sector that was previously entirely dependent on government funding. The National Integrated Power Projects (NIPPs), a set of gas-fired power plants initiated by the government, saw some success in adding to the nation's generation capacity. Although plagued by challenges, these projects were a testament to the government's commitment to increasing power supply, an objective that was partially achieved.

Despite these achievements, the EPSRA failed to deliver the promised steady power supply, largely due to fundamental gaps and weaknesses in its design and implementation. This was, and remains, the single biggest weakness of the post-privatization framework. The reform failed to address the massive liquidity crisis in the sector [13]. This was caused by two primary factors, particularly the metering system. A vast majority of Nigerian electricity consumers were, and still are, not metered. This reliance on "estimated billing" led to a lack of consumer confidence, a high rate of commercial losses due to meter bypass, and a significant shortfall in revenue for the DisCos.

Secondly, political considerations often prevented the NERC from approving a tariff that reflected the true cost of generating and distributing power. Without a viable tariff, DisCos could not generate enough revenue to pay the

GenCos and the gas suppliers, creating a vicious cycle of debt that stifled investment and prevented infrastructure upgrades.

Besides these, inadequate transmission infrastructure also crippled the energy sector. The Transmission Company of Nigeria (TCN), which remained a government-owned entity, was a critical bottleneck. The national grid was (and still is) weak, outdated, and unable to evacuate the little power generated. With over 100 documented system collapses in the last decade, the grid's unreliability made it a significant deterrent to both GenCos and DisCos [14].

The reforms did not adequately address the political economy of the power sector. A significant portion of Nigeria's power generation is gas-fired, but the privatization failed to resolve the legacy debts owed to gas producers. This led to an inconsistent supply of gas, with many GenCos operating well below their capacity. The political interference in tariff setting and the award of contracts further eroded investor confidence and undermined the integrity of the market.

2.1.4 Critiques of the EPSRA 2005 and its Legacy

The failure of the 2005 reforms to deliver a consistent power supply has been a subject of extensive critique from both the public and academia. The most prominent critique is the immense public disillusionment that followed the privatization. Nigerians, tired of the "NEPA" saga, had high hopes that private players would solve the problem. However, the reality of continued power outages and escalating tariffs led to widespread frustration.

Critics, including academic scholars and industry analysts, argue that the privatization process itself was flawed. Some argue that the assets were sold to private companies that lacked both the technical expertise and the financial capacity to turn the sector around [5, 8]. A key academic critique is that the EPSRA merely privatized a flawed, centralized system without fundamentally addressing the underlying structural issues. The national grid remained a monopoly, and the regulatory powers were still concentrated in the federal capital, which was too far removed from the regional realities to be effective [15].

2.2 The New Frontier: The Electricity Act 2023

Recognizing the failures of the EPSRA, the Nigerian government enacted the Electricity Act 2023, a landmark piece of legislation designed to address the key shortcomings of its predecessor. This Act represents a strategic shift in policy direction, moving from a centralized privatization model to a decentralized, market-driven framework. The new Act is driven by several bold objectives and targets:

(1) Decentralization and De-monopolization: The Act empowers states, local governments, and individuals to generate, transmit, and distribute electricity, effectively breaking the federal monopoly and creating a parallel, intra-state electricity market.

(2) Promoting Renewable Energy: The Act places a strong emphasis on renewable energy, with provisions for a comprehensive renewable energy strategy and mandatory renewable generation obligations for licensees.

(3) Universal Energy Access: The Act reinforces the commitment to achieving universal energy access, particularly through off-grid and rural electrification initiatives.

(4) Attracting Private Investment: By streamlining the licensing process and providing a clear legal framework for intra-state power projects, the Act aims to de-risk investments and attract significant private capital.

2.3 Strengths and Achievements of the Electricity Act 2023

The new Act has several inherent strengths that position it for greater success than the EPSRA. The most significant strength is the legal backing it provides for state-level electricity markets. Already, several states, including Lagos, Edo, and Kaduna, are moving to establish their own electricity laws and regulatory bodies, which would have been impossible under the previous framework. This empowers states to create bespoke solutions for their unique energy challenges [15, 13].

Moreover, the Act's strong emphasis on mini-grids and other off-grid solutions acknowledges the reality that the national grid may not be a viable solution for all communities. This policy shift is critical for achieving inclusive energy utilization, especially in rural and remote areas. The success of the Nigeria Electrification Project (NEP), which has already deployed thousands of solar home systems and mini-grids, serves as strong evidence base for this approach [14].

While implementation is still ongoing, the Act provides a stronger legal basis for a more transparent and cost-reflective tariff regime. Recent tariff adjustments for certain consumer classes are a testament to the government's

newfound political will to make the sector financially viable, which is a key strength.

Despite its promise, the new Act is not without its own set of gaps and potential weaknesses, which have been subject to academic and public critique. The biggest critique is whether state governments have the institutional and technical capacity to effectively regulate and manage their own electricity markets. The risk of creating 37 fragmented and uncoordinated power markets, each with its own set of rules, is a significant concern [16].

The devolution of power raises questions about equity. Will wealthier, more industrialized states be able to attract investments and provide stable power while poorer states fall further behind? The Act's critics argue that it erodes the principle of cross-subsidization, which previously allowed richer areas to subsidize power for poorer ones, potentially exacerbating regional inequality [16].

In a different manner, the Act does not fully resolve the problem of the national grid. The Transmission Company of Nigeria (TCN) remains a federal monopoly, and until it is unbundled and its infrastructure is significantly upgraded, the national power evacuation and distribution challenges will persist, potentially limiting the scalability of the new state-level initiatives.

2.4 The Core Challenges: An Integrated Perspective

Contemporary literature moves beyond simply identifying problems to analyzing their interconnectedness. The challenges are no longer seen in isolation but as a self-reinforcing cycle. Several authors have provided systematic reviews that integrate the operational, financial, and regulatory issues [15, 17].

Research consistently points to two major operational bottlenecks. The first is the unreliable gas supply to thermal power plants, which accounts for over 80% of the national grid's generation capacity [14]. Reports from the World Bank confirm that gas pipeline vandalism and a failure to pay for gas services are major contributors to low generation output. The second is the fragile transmission and distribution infrastructure (3). The national grid, with over 100 collapses in the last decade, is simply unable to evacuate generated power and is a source of massive technical and commercial losses [14]. The inability of the Transmission Company of Nigeria (TCN) to secure its assets and a lack of investment in a modern grid are cited as key reasons for the country's grid instability.

The financial viability of the Nigerian Electricity Supply Industry (NESI) remains its most critical problem. The literature highlights a perpetual liquidity crisis, driven by a massive metering gap and a non-cost-reflective tariff [13, 14]. Without accurate billing, Distribution Companies (DisCos) cannot generate sufficient revenue to pay for the power they receive from GenCos, which in turn cannot pay gas suppliers. This debt cycle has made the sector unattractive to new private investment, perpetuating the status quo [10].

The literature points to political interference and regulatory inconsistency as the foundational problems. Studies argue that the Nigerian Electricity Regulatory Commission (NERC) has often been constrained by political pressures, leading to delays in tariff adjustments and a lack of enforcement against non-compliant operators. This creates an environment of high risk and low predictability, deterring both foreign and domestic investors [7, 8, 22, 23].

2.5 The Promise of Decentralization and Off-grid Solutions

A new body of literature focuses on the potential of decentralizing power generation and distribution. The Electricity Act 2023 is a key focus here. Some studies argue that by allowing states to regulate their own electricity markets, the Act can bypass the inefficiencies of the national grid [5, 7]. This new framework empowers states to attract private sector investment in embedded generation and mini-grids, which are seen as a faster and more efficient way to achieve universal energy access [18, 19]. The success of the Nigeria Electrification Project (NEP), which has already deployed thousands of solar home systems and mini-grids, serves as a strong evidence base for this approach [15, 16]. The literature also highlights that a decentralized model can better leverage Nigeria's diverse energy potential, from solar in the north to hydro and biomass in the south, tailoring solutions to regional needs.

Brazil's power sector reforms, initiated in the 1990s, offer a relevant parallel. The country unbundled its state-owned utility and introduced a competitive market with a focus on a strong, independent regulatory agency (ANEEL). While Brazil's reform led to increased private investment and improved efficiency, it also exposed challenges related to regional inequality and the complexity of regulatory oversight. This highlights the need for Nigeria to establish a robust federal-state coordination mechanism to prevent a fragmented market.

South Africa's Integrated Resource Plan (IRP) serves as an example of a policy-driven approach to address a power supply crisis. The IRP aims to strategically plan for future electricity demand, integrating both conventional

and renewable energy sources (Wikipedia, 2025). However, its implementation has been fraught with challenges, including political interference, slow project approvals, and a lack of funding for key infrastructure [19-21]. Nigeria can learn from this by ensuring that its new policies are not only well-intentioned but also have clear, enforceable implementation frameworks with dedicated funding.

India's transformation into a global leader in renewable energy provides a powerful model for Nigeria. India's success was driven by a stable policy framework (the National Solar Mission), competitive reverse auctions that drove down costs, and catalytic financing from MDBs like the World Bank [10, 11]. This demonstrates that strong policy signals and strategic partnerships are essential to mobilize the private capital required for a clean energy transition.

3. Materials and Methods

This study employs a qualitative research methodology. The research design is centered on a comprehensive and systematic documentary analysis and comparative case study analysis. This approach was chosen to provide an in-depth and holistic exploration of the complex factors driving energy sector transformations in different global contexts, and to critically evaluate the potential of the new Nigerian policy reforms without relying on primary data collection. The data for this study were sourced exclusively from a diverse range of secondary sources, ensuring a robust and well-rounded analysis. Peer-reviewed journal articles, academic books, and doctoral dissertations on energy policy, sustainable development, and economic transformation in Nigeria and other developing nations. This includes reputable journals and platforms such as Scirp.org, MDPI, and ResearchGate.

Official reports, working papers, and policy briefs from key global bodies. Specifically, the study drew heavily from the World Bank's recent reports on Nigeria's power sector, the International Renewable Energy Agency (IRENA) on global energy transition, the International Energy Agency (IEA) for its forecasts and policy analysis, and the United Nations Development Programme (UNDP) for its development-focused perspectives.

The study performed a meticulous analysis of official government documents, including the full text of the Electricity Act 2023, the National Energy Transition Plan, and communiqués from the Ministry of Power and the Nigerian Electricity Regulatory Commission (NERC). Industry reports from leading consulting firms such as PwC and KPMG provided critical insights into market dynamics and investor sentiment.

The research design is a two-step process. A thematic analysis was performed on all collected documents. The documents were meticulously read and coded to identify recurring themes, key policy instruments, strategic drivers, and the roles of various actors (e.g., government, private sector, MDBs). Data was extracted and organized into categories related to the research objectives, such as "regulatory frameworks," "financing mechanisms," "technological innovation," and "political economy."

4. Results and Findings

The analysis of recent policy changes and a comparative review of previous studies reveal a significant shift in Nigeria's energy landscape, moving from a static, centralized system to a more dynamic, decentralized one. The findings confirm that while a persistent energy deficit remains, the legal framework of the Electricity Act 2023 has already begun to produce tangible, albeit nascent, results that were not seen under previous reform efforts.

4.1 The Impact of Decentralization: A Departure from the Past

Previous studies on the post-privatization era consistently highlighted the failure of the centralized, market-driven approach to attract significant investment [11, 12]. The key finding of this paper is that the decentralized framework is a critical departure from this model. By devolving regulatory and licensing powers to states, the new Act has created a legal basis for investors to bypass the inherent risks of the national grid. For instance, recent reports show that states have begun to enact their own electricity laws and are actively attracting private sector investments in embedded generation and mini-grids [14]. This marks a clear difference from the pre-2023 period, where such investments were hindered by complex federal regulations and a lack of clear legal authority.

4.2 Financial Viability: A Glimmer of Hope

Earlier research consistently pointed to the inability of the sector to attract capital due to its financial insolvency, which was rooted in a non-cost-reflective tariff and a massive metering gap [8, 9]. The new findings suggest that

recent tariff adjustments and a renewed push for metering are beginning to change this narrative. The April 2024 tariff hike for Band A consumers, which promises a guaranteed minimum of 20 hours of supply, has reportedly led to a significant increase in revenue collection and a more predictable income stream for power sector companies [16, 17]. While this move is politically sensitive and its full impact is yet to be realized, it represents a more forceful and successful attempt at achieving financial viability compared to previous, often-reversed, tariff orders.

4.3 The Rise of Off-grid Solutions: A Verified Pathway

The paper's findings on the potential of off-grid and renewable energy solutions are strongly supported by and build upon previous studies. While earlier reports highlighted the potential of solar, more recent data confirms that this segment is now a key driver of growth [10, 11]. The new legal framework, combined with continued support from projects like the Nigeria Electrification Project (NEP), has catalyzed significant private investment in mini-grids and solar home systems. The findings of this paper suggest that this trend is not a temporary fix but a permanent, parallel path to achieving universal energy access, a finding that validates and expands on the initial projections of early reports.

4.4 Lessons from Global Comparisons: The Need for Implementation

The comparative analysis reveals that Nigeria's current policy trajectory aligns with the successful market liberalization efforts seen in countries like Brazil, but its success will hinge on avoiding the pitfalls of others, such as South Africa. The key finding is that while the new policy is well-crafted, its implementation remains the biggest variable. Just as India's renewable energy success was built on a consistent policy framework and clear incentives, Nigeria's new reforms must be accompanied by robust enforcement, clear state-federal coordination, and a strong political will to see the reforms through. The new legal framework is the foundation, but a sustained, multi-stakeholder effort is required to build on it.

5. Conclusion

Nigeria's persistent power sector deficit has long been a major impediment to national development. However, the enactment of the Electricity Act 2023 represents a monumental shift in policy, moving from a failing centralized model to a decentralized, market-driven framework.

The new Act represents Nigeria's most significant opportunity to fundamentally transform its power sector. Its core strengths lie in its acknowledgment that a one-size-fits-all, federal-centric model is inadequate. By empowering states, promoting off-grid solutions, and providing a legal framework for private sector-led development, the Act can be the catalyst for a more inclusive and steady supply of power. However, the success of this monumental policy shift is not guaranteed. It will depend on the political will to overcome implementation challenges, ensure regulatory consistency, and address the fundamental issues of financial viability and infrastructure security. Nigeria's quest for light is far from over, but with the new Act, the nation is finally on a promising path to unlocking its immense energy potential and lighting up every corner of its economy.

5.1 Policy Recommendations

Based on the findings of this paper, the following policy recommendations are crucial for the successful implementation of the Electricity Act 2023 and the achievement of steady and inclusive power supply in Nigeria:

(1) Establish a National-Level Coordination Committee: A strong federal-state coordination mechanism is essential to prevent a fragmented regulatory landscape. This body should provide a clear, harmonized framework for state-level electricity markets to ensure consistency and maintain investor confidence.

(2) Accelerate Off-Grid Electrification: The Federal and State Governments should prioritize the development of off-grid and decentralized renewable energy solutions. This requires creating dedicated, transparent policy and a simplified licensing regime for mini-grids and solar home systems, particularly in underserved rural and peri-urban areas.

(3) Enforce and Sustain Cost-Reflective Tariffs: The government must demonstrate the political will to enforce a cost-reflective tariff regime across all consumer bands. This is the single most important step to resolving the sector's liquidity crisis and attracting the long-term private capital required for infrastructure upgrades.

(4) Implement a Targeted Metering Program: The new policy must be accompanied by an aggressive, time-

bound plan to close the metering gap. This will not only ensure fair billing but also boost revenue collection efficiency, making the entire value chain more financially viable.

(5) Promote Public-Private Partnerships for Critical Infrastructure: The government should enter into strategic Public-Private Partnerships (PPPs) to address the bottlenecks in the transmission and distribution networks. This includes attracting investment for a modern SCADA system, upgrading transmission lines, and securing these assets from vandalism.

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