

Unlocking Nigeria's Wind Energy Sector

An Evidence-Based Analysis of
Development Barriers and Policy Solutions

ANALYTICAL BRIEF



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Executive Summary

Nigeria's wind energy potential remains largely untapped nearly two decades after it was first identified as a viable component of the country's energy mix. Estimates of the resource vary; IRENA places it at approximately 3,200 MW, while Nigeria's Renewable Energy Roadmap suggests the figure could exceed 4,000 MW when accounting for varying wind speeds across different regions.¹⁴ This variance itself signals a national wind resource data gap, particularly for southern and offshore areas. Yet installed utility-scale wind capacity remains limited to the 10 MW Katsina Wind Farm (Lambar Rimi), contracted to French firm Vergnet in 2009 and formally commissioned in March 2021 after a 16-year development history, subsequently fell into non-operational status due to insecurity, financing gaps, and ownership uncertainties.^{1 22} In February 2024, the House of Representatives formally described it as an 'abandoned wind farm.'²³ The Katsina State Government has since been pursuing its revival and hybridisation with an additional 10 MW of solar power, with a formal transfer of ownership from the Federal Government to the state pending as of July 2026.²⁴ The original project was contracted at €18.5 million plus ₦494.02 million,²⁵ equivalent to approximately €1,850 per kW of installed wind capacity plus approximately ₦49,402 per kW based on the original contract value. No new utility-scale wind project has been commissioned in Nigeria since 2021.

This analytical brief identifies the key barriers preventing Nigeria from converting its wind resource potential into operational capacity, drawing on a systematic review of the renewable energy barrier literature and Nigeria-specific regulatory and market analysis.² The barriers are grouped into six categories:

- Policy and regulatory
- Grid and transmission
- Financing and investment
- Data and technical
- Institutional
- Social and land-related.

For each, the brief sets out a concrete, actionable recommendation.

KEY MESSAGES:

A 2024 peer-reviewed global assessment of wind energy deployment barriers found that financial obstacles rank highest overall, with limited government subsidies, lack of dedicated wind policy, and unbalanced feed-in-tariff design among the most significant barriers worldwide², closely mirroring Nigeria's own policy and financing gaps, discussed in this brief.

Nigeria's 2015 Feed-in Tariff caps wind at 10 MW, with no competitive procurement framework for larger utility-scale projects, unlike Egypt's BOO model or South Africa's REIPPPP.

Recent regulatory progress, including the Net Billing Regulations 2026 and Mini-Grid Regulations 2026, signals positive momentum, but neither directly addresses utility-scale wind development.³

Closing the gap requires coordinated action across policy, grid planning, financing, data, and institutional leadership, not a single fix, but a sequenced set of reforms.

1. Introduction: A Resource Still Waiting to Be Unlocked

Nigeria's wind energy story has, for over a decade, been defined by a single project: the Katsina Wind Farm, which originated as a state project in 2005, was contracted to French firm Vergnet by the Federal Government in 2009, and was eventually contracted to French firm Vergnet in 2009 and formally commissioned in March 2021 after years of repeated delays, subsequently fell into non-operational status due to insecurity, financing gaps, and ownership uncertainties.^{1 22} In February 2024, the House of Representatives formally described it as an 'abandoned wind farm,'²³ and the Katsina State Government is now pursuing its revival and hybridisation with solar power.²⁴ No new utility-scale wind project has been commissioned in Nigeria since 2021. Meanwhile, countries and continental peers such as Egypt and South Africa, examined in NWECC's February 2026 Monthly Industry Update²⁰, have moved from pilot projects to gigawatt-scale wind sectors over a similar or shorter timeframe. And even Senegal, which is part of West Africa, like Nigeria, has about 158 MW of installed wind energy capacity in Taiba Ndiaye, about 100km from Senegal's capital, Dakar²⁶.

The gap is not primarily one of resource availability. Average wind speeds in Nigeria's northern states regularly exceed 7 m/s at measurement height, placing several locations within the range considered viable for utility-scale wind development.⁴ The gap, instead, lies in the surrounding ecosystem of policy, infrastructure, financing, technical shortcomings of the grid in accepting distributed renewable energy sources, and institutional coordination required to convert a wind resource into an operating wind farm.

This brief sets out the six categories of barriers most frequently identified in the literature and in Nigeria-specific analysis, and for each, proposes a recommendation that NWECC believes is both achievable and consistent with the lessons drawn from comparable African markets.

2. Policy and Regulatory Barriers

2.1 A Feed-in Tariff That Was Not Designed for Utility-Scale Wind

In 2015, the Nigerian Electricity Regulatory Commission (NERC) introduced the Regulations on Feed-in Tariff for Renewable Energy Sourced Electricity (REFIT), covering renewable projects between 1 MW and 30 MW.⁵ Within this framework, wind projects are capped at 10 MW for automatic feed-in tariff treatment; projects above this threshold are intended to go through a competitive bidding process administered by the Nigerian Bulk Electricity Trading Company (NBET).⁶ In practice, no such competitive bidding round for utility-scale wind has yet been conducted.

This stands in sharp contrast to Egypt's Build-Own-Operate model and bankable PPAs with the Egyptian Electricity Transmission Company, and South Africa's REIPPPP, both of which created clear, repeatable pathways for utility-scale wind investment, as set out in NWECC's February 2026 update. In Nigeria's case, there is no public record of a competitive bidding round for utility-scale wind having been conducted to date, a gap reflected in the fact that the Katsina Wind Farm, commissioned in March 2021 after a 16-year development history but subsequently non-operational and formally described as 'abandoned' by the House of Representatives in February 2024²³ remains the country's only utility-scale wind installation more than a decade after the 2015 REFIT framework was introduced.

This structural gap is exacerbated by Nigeria's historical reliance on non-public, privately negotiated bilateral Power Purchase Agreements (PPAs) for thermal generation, such as the Azura-Edo IPP, Okpai IPP, and Afam VI frameworks, rather than transparent, competitive open-bidding rounds. These legacy agreements heavily utilised confidential "take-or-pay" clauses and sovereign dollar-denominated guarantees, which locked up national fiscal capacity in the thermal sector while shielding the specific commercial terms, gas pricing formulas, and tariff structures from public scrutiny. While recent policy mandates have introduced digital transparency requirements to force future energy contracts into the public domain, the historical precedence of closed-door, bilateral thermal procurement continues to stifle the creation of clear, repeatable pathways necessary to attract utility-scale wind investment ^{27 28 29}.

2.2 Renewable Procurement Obligations on Discos Remain Largely Unenforced

The 2015 REFIT regulation established a national programme cap of 2,000 MW of renewable energy sourced electricity, 1,000 MW by the end of 2018 and 2,000 MW by the end of 2020 to be split equally between NBET (50%) and the eleven electricity distribution companies or Discos (50%), as set out in Sections 5(f) and 8(h) of the Regulation. Within this framework, the wind energy allocation was modest: just 205.8 MW of the initial 1,000 MW target, with 93.3 MW assigned to Discos collectively and 112.5 MW to NBET (Schedule 3 of the Regulation). More than a decade on, the 2020 targets were never met, and there is little publicly available evidence of active enforcement or compliance monitoring. The power sector's severe and well-documented liquidity crisis meant that neither NBET nor the Discos could guarantee payments to renewable energy developers, rendering the procurement obligations effectively unworkable in practice.⁷

2.3 Licensing and Environmental Approval Processes Are Slow and Fragmented

Securing a generation licence from NERC requires, among other things, an Environmental Impact Assessment (EIA) approval.⁸ Combined with state-level land and permitting requirements, the overall approval pathway for a wind project in Nigeria is widely described in the literature as slow, complex, and inconsistent, discouraging the kind of long-horizon investment that utility-scale wind requires.⁹

3. Grid and Transmission Barriers

3.1 High-Wind Zones Are Often Far From Existing Transmission Infrastructure

Insufficient transmission grid infrastructure is consistently identified as a major barrier to wind power development worldwide, alongside financial obstacles, limited government subsidies, and unbalanced feed-in-tariff design.² In Nigeria's case, the states with the strongest wind resources, concentrated in the north, are not always those with the most developed transmission infrastructure, creating a 'project-ready, grid-not-ready' risk highlighted in NWECC's February 2026 update.

3.2 TCN's Expansion Programme Creates a Window of Opportunity

As of early 2026, Nigeria's Transmission Company of Nigeria (TCN) states, citing NERC's February 2026 Operational Factsheet, that the national grid can wheel up to 8,700 MW, against a record peak generation of 5,801.84 MW achieved in March 2025. Nigeria's Integrated Resource Plan 2024 (NIRP 2024), published by the Federal Ministry of Power, separately allocates approximately USD 192 million toward 16 new transmission lines covering roughly 595 km between 2024 and 2028, specifically to strengthen inter-zonal transmission lines and facilitate the integration of additional renewable energy sources into the grid.¹⁰ ¹¹The NIRP's Annex F, which presents the Detailed NIRP Scenario Results, projects wind power entering the national generation mix from 2041, with installed wind capacity increasing from 100 MW in 2041 to 900 MW by 2045, while wind generation rises from 0.2 TWh to 2.0 TWh over the same period.

This expansion programme represents a genuine window of opportunity: if wind corridors in high-resource states are explicitly factored into the routing of these new lines, Nigeria could avoid the costly retrofit problem that has affected renewable integration elsewhere.

3.3 Grid Codes Are Not Yet Adapted for Variable Generation

Wind power's variability requires grid codes, forecasting protocols, and operational practices that differ from those designed around dispatchable thermal generation. Nigeria's grid codes and System Operator practices have not yet been comprehensively updated to address the specific characteristics of wind generation at scale.

4. Financing and Investment Barriers

4.1 High Upfront Costs and Currency Risk

Wind turbine components remain almost entirely imported (as detailed in NWECC's May 2026 Raw Materials update²¹), exposing project capital costs to foreign exchange volatility. Combined with Nigeria's relatively high cost of capital, this significantly affects the bankability of wind projects compared to peer markets.

The capital cost of a utility-scale onshore wind project globally ranges from approximately USD 1,000 to USD 1,800 per kilowatt of installed capacity^{30,31}, meaning a 100 MW project requires between USD 120 million and USD 180 million in upfront capital before revenues are generated. In Nigeria's context, this cost is further inflated by: the full import cost of turbines and components given the absence of any domestic wind manufacturing base; foreign exchange exposure on imported equipment in a currency that has experienced significant devaluation; high commercial lending rates which make local debt financing for wind projects extremely expensive; and the cost of developing transmission connections in underserved northern regions at the developer's expense under the current REFIT framework. These factors combine to make the effective cost of wind development in Nigeria significantly higher than regional peers such as South Africa or Egypt, where concessional financing, currency hedging instruments, and government-backed PPAs materially reduce the risk profile.

4.2 Investment in Renewables Is Growing - But Not Reaching Wind

Nigeria's renewable energy sector has attracted over USD 1 billion in investment over the past five years, according to recent analysis.¹² Available reporting on this investment does not break out a wind-specific share; however, the absence of any new utility-scale wind projects since Katsina suggests that wind has attracted little of this capital to date, consistent with a smaller pipeline of bankable wind projects and the absence of dedicated wind financing instruments.

4.3 No Dedicated Fiscal Incentives for Wind Components

Unlike some peer markets that deploy targeted tax holidays, import duty waivers, and accelerated capital allowances to catalyse early-stage wind energy development and localization, Nigeria currently operates without a wind-specific fiscal incentive framework. While general investment incentives under existing legislation extend to certain renewable technologies, these broad mechanisms fail to address the distinct capital and structural challenges unique to the wind energy value chain. Consequently, the absence of tailored fiscal regimes remains a primary barrier to both renewable energy deployment and domestic industry development within Nigeria's emerging wind sector.¹³

5. Data, Technical, and Institutional Barriers

5.1 Wind Resource Estimates Vary Widely

Published estimates of Nigeria's wind energy potential vary. IRENA places it at approximately 3,200 MW, while the Nigeria Renewable Energy Roadmap, developed by IRENA in collaboration with the Energy Commission of Nigeria and published in January 2023, suggests the figure could exceed 4,000 MW when accounting for varying wind speeds across different regions.¹⁴ A further peer-reviewed analysis of Nigeria's renewable energy sector published in 2024 similarly notes the wide variance in wind potential estimates and attributes it in part to incomplete resource data for southern and offshore areas.¹⁵ This variance is itself evidence of a data and definitional gap, particularly for Nigeria's southern, coastal, and offshore areas, where the Federal Ministry of Power has reportedly begun comprehensive mapping that remains incomplete.¹⁶

5.2 Limited Local Technical Expertise and High Import Dependence

Technical barriers, including limited local wind-specific engineering expertise and high import costs for turbine components, increase both project risk and project cost.¹⁷ NWECC's May 2026 Raw Materials update identified the specific Nigerian states where steel, cement, and industrial mineral inputs for wind components are available, providing a starting point for addressing this barrier through local content development.

5.3 Fragmented Institutional Mandates

Responsibility for wind energy in Nigeria is distributed across the Federal Ministry of Power, Nigerian Electricity Regulatory Commission (NERC), the Rural Electrification Agency (REA), and the Energy Commission of Nigeria, among others, with administrative obstacles including bureaucratic delays and a lack of coordination among agencies repeatedly identified as a constraint on renewable energy implementation.¹⁸ In Egypt, the New and Renewable Energy Authority (NREA) provides a single clear institutional lead for wind; Nigeria currently has no equivalent.

6. Social and Land-Related Barriers

Utility-scale wind farms require significant land areas and, in many cases, new access roads and transmission spurs. Land acquisition processes in Nigeria can involve overlapping customary and statutory tenure systems, and right-of-way negotiations for transmission infrastructure have historically been a source of project delay across the power sector.

Without structured community engagement and benefit-sharing arrangements, wind projects risk local opposition, a risk that South Africa's REIPPPP explicitly addressed through local content thresholds, community ownership stakes, and skills development commitments, as set out in NWECC's February 2026 update on lessons from Egypt and South Africa.

7. Summary: Barriers and Recommended Solutions

The table below consolidates the barriers and corresponding recommendations discussed in this brief, organised by category.

Category	Key Barrier	Recommended Solution
Policy & Regulatory	Feed-in Tariff (FiT) for wind is capped at 10 MW, with no competitive procurement framework for utility-scale wind above this threshold	Introduce a dedicated wind energy procurement framework, competitive auctions for projects above 10 MW, modelled on South Africa's REIPPPP
Policy & Regulatory	The 2015 REFIT regulation set a 2,000 MW renewable energy programme cap split 50/50 between NBET and Discos, with wind allocated only 205.8 MW of the initial 1,000 MW target (Schedule 3). The 2020 targets were never met, and the obligations were never effectively enforced	NERC to establish a transparent compliance monitoring framework for REFIT obligations, and develop a revised procurement target aligned with current grid capacity and Nigeria's renewable energy ambitions
Policy & Regulatory	Slow, fragmented licensing and EIA approval processes discourage investors	Establish a one-stop shop for wind project licensing, coordinating NERC, the Ministry of Environment, and state governments
Grid & Transmission	Nigeria's highest-wind zones (northern states) are often distant from existing high-capacity transmission infrastructure	Integrate wind corridors into TCN's transmission expansion plan (the 16 transmission lines, USD 192 million programme running to 2028)

Category	Key Barrier	Recommended Solution
Grid & Transmission	Grid codes and operational practices are not yet adapted for variable wind generation	Develop wind-specific grid codes and forecasting protocols in coordination with TCN and the Nigerian Independent System Operator (NISO)
Financing & Investment	High upfront capital costs, foreign exchange risk, and limited long-term local-currency financing constrain wind project bankability	Develop blended finance facilities with DFIs (World Bank, AfDB, GET.invest), combining concessional and commercial capital for wind
Financing & Investment	No dedicated tax incentives or import duty waivers exist for wind turbine components	Introduce tax holidays and import duty waivers for wind turbine components during the localisation transition period
Financing & Investment	Absence of standardised, bankable Power Purchase Agreements (PPAs) for wind, specifically	Develop standardised wind PPA templates with the Nigerian Bulk Electricity Trading Company (NBET)
Data & Technical	Wind resource estimates vary between IRENA's 3,200 MW and the Nigeria RE Roadmap's 4,000+ MW figure, reflecting incomplete national wind mapping, especially offshore and in the south	Expand wind measurement campaigns nationwide, including coastal and offshore sites and publish a unified National Wind Atlas
Data & Technical	Limited local technical expertise and high import costs for turbine components increase project risk	Invest in technical training programmes and accelerate local content development for components identified in NWECC's Raw Materials report in May 2026
Institutional	Multiple agencies (Ministry of Power, NERC, REA, Energy Commission of Nigeria) have overlapping mandates with limited coordination on wind	Designate a clear lead institution for wind energy coordination, empowering REA, as recommended in NWECC's February 2026 update
Social & Land	Land acquisition, right-of-way disputes, and limited community engagement create project delays and local opposition risk	Adopt community engagement frameworks and local content/benefit-sharing requirements, drawing on South Africa's REIPPPP model

8. Recent Regulatory Momentum Worth Building On

While the barriers above remain substantial, recent regulatory developments suggest growing institutional willingness to modernise Nigeria's renewable energy framework, even if not yet targeted specifically at utility-scale wind:

- **Net Billing Regulations 2026:** NERC commenced implementation in June 2026, allowing eligible consumers (50 kW to 1.5 MW) to generate renewable power for self-use and export surplus electricity to the grid, formally recognising 'prosumers' in Nigeria's electricity market for the first time.³
- **Mini-Grid Regulations 2026:** Published in April 2026, these regulations raised the capacity cap for mini-grids from 1 MW to 5 MW (isolated) and 10 MW (interconnected), with risk-based environmental compliance and a 30-business-day permit processing timeline, directly relevant to wind-solar hybrid mini-grid development in northern Nigeria.¹⁹
- **TCN Transmission Expansion:** The ongoing programme to raise national wheeling capacity from 8,700 MW toward a 10,000 MW target by end-2026 represents a genuine opportunity to incorporate wind corridor connectivity into national grid planning, if wind-specific advocacy is timed appropriately.¹⁰

NWECC's role is to ensure that, as these reforms continue, utility-scale wind is not left behind by maintaining sustained advocacy, supplying the data (through wind measurement campaigns) that

policymakers need, and continuing to draw on the lessons of Egypt, South Africa, and other markets that have successfully closed this gap.

Conclusion

Nigeria's wind energy sector stands at a familiar crossroads: a resource that is real but underutilised, a policy framework that exists but was not designed for the scale of project now required, and a set of institutional, financing, and infrastructure gaps that are well understood but not yet systematically addressed.

None of the six barrier categories identified in this brief is unique to Nigeria, and none are insurmountable, as the experiences of Egypt and South Africa demonstrate. What is required is not a single intervention, but a sequenced programme of reform: a competitive procurement framework for utility-scale wind, transmission planning that explicitly incorporates wind corridors, financing instruments tailored to wind's risk profile, a unified national wind atlas, clearer institutional leadership, and structured community engagement.

NWECC will continue to advocate for each of these reforms and to provide the data, analysis, and policy engagement needed to support them, building toward the day when Nigeria's installed wind capacity reflects the resource that has been documented for over a decade.

Removing these barriers will not happen overnight, but each one has a known solution, tested in comparable markets. The task now is sequencing, coordination, and sustained policy commitment.

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