INVESTMENT AND FINANCING MECHANISMS FOR ENERGY SECURITY IN NIGERIA. A POLITICAL ECONOMY PERSPECTIVE

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https://doi.org/10.54989/stusec.2025.19.02.20

Abstract

Energy security is a pressing issue in Nigeria, where ongoing challenges like poor infrastructure, reliance on fossil fuels and limited access to sustainable financing are holding back the development of a developed and robust energy system. This paper analyzes the impact of various investment and financing strategies by focusing on foreign direct investment (FDI), green bonds, and development finance, which are all within the framework of the global energy transition. Using a political economy perspective and backed by secondary data from both international and national sources (World Bank World Development Indicators (WDI), African Development Bank (AfDB), Central Bank of Nigeria (CBN), Nigerian National Petroleum Company (NNPC), International Energy Agency (IEA), the study explores how financial inflows, public-private partnerships and international climate funds can affect Nigeria's efforts to diversify and sustain its energy resources.The results show that while Nigeria has successfully drawn in significant investments in oil and gas sector, funding for renewable energy is still lacking due to regulatory uncertainties, infrastructure challenges and limited access to green finance options. The research highlights the importance of strengthening institutional frameworks, enhancing financial transparency and promoting regional cooperation as vital steps toward improving energy security. In conclusion, the paper believes that when aligning investment strategies with climate and security objectives is a way that could position Nigeria as a key player in Africa's energy transition and support long-term economic stability.

Keywords: energy security; financing mechanisms; investment; Nigeria

Introduction

Energy security has become one of the most urgent issues in today's global economic and political conversations. It's not just about having energy resources; it's also about making sure they're affordable, accessible and sustainable, all while maintaining a stable geopolitical landscape[3]. For developing countries like Nigeria, energy security is crucial for both

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[3] John Paravantis, Nikoletta Kontoulis, Athanasios Ballis, Dionysios Tsirigotis, Vasilios Dourmas, *A Geopolitical Review of Definitions, Dimensions and Indicators of Energy Security*, 9th International Conference on Information, Intelligence, Systems and Applications, 2018, https://doi.org/10.1109/IISA.2018.8633676 (10.10.2025)

economic growth and national safety. Even though Nigeria is the largest crude oil producer in Africa, it still struggles with persistent electricity shortages, a heavy reliance on imported refined petroleum products and slow progress in adopting renewable energy sources.[1] These challenges pose serious risks to industrial productivity, financial stability and social unity.

In today's world, as we navigate the global energy transition and work towards decarbonization, it's clear that securing a reliable and sustainable energy supply demands a hefty dose of investment and some creative financial solutions. The worldwide move towards low-carbon energy has ramped up the competition for climate finance, foreign direct investment (FDI), and development aid, all of which play a crucial role in a country's ability to ensure energy security while also chasing environmental objectives[2]. For Nigeria, the real challenge is figuring out how to gather enough sustainable financing to diversify its energy sources, upgrade its infrastructure, and lessen its reliance on fossil fuels. It is clear from existing evidence that while Nigeria is still a magnet for foreign direct investment in the oil and gas sector, the funding for renewable and clean energy is lagging behind.[3]

The introduction of sovereign green bonds in 2017 and 2019 marked a significant shift towards sustainable finance, but there are still institutional, regulatory and governance hurdles that prevent large-scale investments from taking off. Likewise, development finance institutions (DFIs) like the AfDB and the World Bank have been backing energy projects, yet they face challenges like bureaucratic delays and a limited capacity to absorb funds, which hampers their overall impact.

The focus of this study is to explore how different investment and financing methods such as development finance, green bonds and foreign direct investment (FDI) impact Nigeria's energy security in the larger context of international relations. It aims to assess how/whether these financial resources either boost or hinder the country's efforts to achieve energy diversification, reliability and sustainability. Additionally, this paper investigates the policies and institutional frameworks that oversee energy investment in Nigeria and suggests ways to utilize global financial tools to enhance national energy resilience. By placing Nigeria's situation within the global conversation about energy transition, this study helps shed light on how economic and financial policies relate to security issues in shaping sustainable energy futures.

Scope and Limitations

The study focuses on Nigeria as a case study representative of resource-dependent economies undergoing energy transition. The time frame of 2010-2024 captures major policy shifts, including the issuance of green bonds and Nigeria's Energy Transition Plan. However, the study acknowledges certain limitations. Firstly, the reliance on secondary data restricts the ability to account for informal financing and unrecorded investments. Secondly, variations in data reporting standards across institutions may introduce minor discrepancies. Lastly, while the correlation analysis shows connections between investment flows and energy security outcomes, it does not imply causality. Despite these limitations, triangulating

[1] Oluwatoyin Somoye, *Energy crisis and renewable energy potentials in Nigeria: A review*, *Renewable and Sustainable Energy Reviews*, p. *188*, https://doi.org/10.1016/j.rser.2023.113794 (10.10.2025)

[2] Samuel Sarkodie, Samuel Adams, Thomas Leirvik, *Foreign Direct Investment and Renewable Energy in Climate Change Mitigation: Does governance matter?* "Journal of Cleaner Production", 2020, https://doi.org/10.1016/j.jclepro.2020.121262 (12.10.2025)

[3] Ari Mayor, *The determinants and impact of inward oil and gas FDI in Nigeria: Thesis submission,* http://hdl.handle.net/2436/624074 (16.10.2025)

multiple data sources and analytical approaches enhances the credibility and depth of the findings.

Literature Review

Conceptualizing Energy Security

Energy security is a complex idea that includes not just the availability and affordability of energy resources, but also how accessible and sustainable they are.[1] It's about more than just having energy; it's also about the reliability of the systems that provide it. For economists and policymakers, energy security has become a crucial part of national resilience, affecting everything from productivity to trade and overall economic stability. In today's world, energy security is closely tied to environmental sustainability and international relations. Any disruptions in energy supply whether due to geopolitical tensions, fluctuating prices, or infrastructure issues can lead to serious economic and security challenges, particularly for energy-dependent developing countries like Nigeria.[2]

In Africa, the challenge of energy security is made even tougher by a mix of structural issues like limited generation capacity, inadequate grid infrastructure, and a heavy reliance on imported fuels. Even though the continent is rich in natural resources, many people in Sub-Saharan Africa still struggle to access affordable and reliable electricity.[3] In Nigeria, these hurdles are even more pronounced due to a lack of investment, inefficiencies in the power sector, and weak institutional frameworks that discourage both local and international investors. As the world shifts towards cleaner energy, Nigeria needs to diversify its energy sources and bolster its financial and institutional capabilities to secure a sustainable energy future.

Investment and Financing in the Energy Sector

Investment and financing play a vital role in ensuring energy security. Research consistently indicates that countries with stable and diverse energy financing strategies are much better positioned to secure their energy supply and respond to unexpected challenges.[4] In developing economies, the lack of access to finance really slows down the progress of energy infrastructure development.

Traditional funding sources like public investment and bank loans just don't cut it when it comes to meeting the huge capital needs of the energy transition. Foreign Direct Investment (FDI) is crucial for bringing in capital, technology, and management know-how to host countries. When it comes to energy security, FDI plays a significant role in expanding infrastructure, exploring resources and embracing cleaner technologies.[5] However, in Nigeria, FDI has largely been funnelled into oil and gas extraction, leaving renewable energy and power generation with very little investment[3]. Factors like regulatory uncertainty, corruption and political risks have made investors very hesitant in committing long-term to non-fossil fuel sectors.

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[1]Marc Audi, *Exploring the Dimensions of Energy Security for Sustainable Global Development*, "Journal of Energy and Environmental Options", Vol. 5, No. 2, 2022

[2]Paravantis et al., *Op. cit*., p.7

[3]Abeeku Brew-Hammond, *Energy access in Africa,* "Challenges ahead, Energy Policy", Vol. 38, No. 5, 2010, pp. 2291–2301, https://doi.org/10.1016/j.enpol.2009.12.016 (11.10.2025)

[4] Benjamin Sovacool, Ishani Mukherjee, *Conceptualizing and measuring energy security: A synthesized approach,* Energy (Oxford, England), 2011, https://doi.org/10.1016/j.energy.2011.06.043 (15.10.2025)

[5]Ojo Adelakun, Fatimah Sayah, Yemisi Adelakun, *The role of foreign direct investment "FDI" in energy infrastructure development in developing countries,* 2025, https://doi.org/10.53999/2297-015-001-006 (15.10.2025)

Green bonds, on the other hand, have surfaced as creative financial tools aimed at channelling funds into environmentally friendly projects. Nigeria made history as the first African nation to issue sovereign green bonds in 2017 and 2019, raising around ₦25 billion (roughly US$70 million) for renewable energy and reforestation efforts.[1] While these initiatives mark a step forward in green finance, their scale still falls short of what the country truly needs. To build investor confidence and boost climate-friendly investments, developing a solid green finance framework is essential. Development Finance Institutions (DFIs) like the World Bank, the African Development Bank (AfDB) and the International Finance Corporation (IFC) have played a key role in financing Nigeria's energy projects.

By providing concessional loans, grants, and technical support, DFIs help with infrastructure upgrades, rural electrification, and renewable energy initiatives. Yet, issues like bureaucratic delays, challenges in project execution, and a lack of national coordination have hindered the effectiveness of these efforts. To maximize the impact of development finance, it's crucial to strengthen institutional capacity and enhance regulatory consistency.

Gaps in Literature

The existing body of research highlights how crucial finance is for achieving energy security, yet it often overlooks the ways in which specific tools like foreign direct investment (FDI), green bonds, and development finance institutions (DFIs) interact in developing countries. There's a noticeable lack of studies that explore Nigeria's energy security by looking at the interplay of finance, governance, and global connections. This study aims to fill that void by offering a comprehensive analysis of the political economy surrounding Nigeria's energy transition.

International Relations and Energy Security

Energy security has always been influenced by the ebb and flow of global geopolitics. Recent events, like the Russia–Ukraine conflict, OPEC's production choices and various supply chain hiccups, have really highlighted just how vulnerable energy markets are too international tensions.[2] For Nigeria, which relies heavily on oil exports for its financial health, these external shocks reveal a deep-seated dependence on the whims of global market dynamics. The worldwide shift towards decarbonization and the decreasing demand for fossil fuels in developed countries also pose challenges for Nigeria's revenue and its strategic role on the global stage.

As a result, international cooperation has become crucial for securing national energy interests. Collaborations through bilateral partnerships, multilateral funds like the Green Climate Fund, and regional energy initiatives can help with technology transfer and financial access. This makes economic diplomacy increasingly important for countries like Nigeria as they navigate the complex interplay of energy, development, and security policies.

Theoretical Framework

This study is built on two key theoretical perspectives: the Political Economy of Energy Security and Sustainable Development Finance Theory. The Political Economy of Energy Security framework points out that energy outcomes are influenced not just by market dynamics but also by political institutions, governance structures and power

[1]Federal Ministry of Environment, *Nigeria's Green Bond Programme: Advancing Sustainable Finance for Development*, Abuja, Federal Government of Nigeria, 2020

[2]Arinaldo Adma, Margaretha Hanita, *Geopolitics Tension, Wars and its Impact on Energy/Oil Crisis: Russia – Ukraine war case study,* "Interdisciplinary Journal and Humanity", 2025, https://doi.org/10.5863 (13.10.2025)

dynamics.[1] It sheds light on how domestic policies, investment incentives and international partnerships shape a country's ability to secure and diversify its energy sources. In Nigeria, this framework helps clarify how weak regulatory institutions, rent-seeking behaviours and inconsistent policies hinder effective energy investment, even with the country's rich natural resources.

On the other side, Sustainable Development Finance Theory emphasizes the importance of financial innovation in reaching long-term development objectives.[2] It argues that having access to a variety of climate-aligned financing options like green bonds, blended finance and concessional loans is essential for achieving both economic and environmental sustainability. When we apply this theory to Nigeria, it becomes clear that securing energy requires not just more investment but also financial strategies that harmonize profitability with sustainability and inclusivity. Together, these theories create a comprehensive framework for examining how investment and financing mechanisms impact Nigeria's energy security within the broader context of international economic and political dynamics.

Methodology

This study takes a mixed-methods approach, blending descriptive and analytical techniques to explore how investment and financing strategies impact Nigeria's energy security journey. By combining quantitative trend analysis with qualitative insights into policy, the research aims to offer a well-rounded view of both the empirical data and the institutional and regulatory frameworks that influence energy outcomes. This methodology aligns perfectly with the journal's focus on deep analysis backed by relevant policy interpretation.

For this study, we gathered annual time-series data from 2010 to 2024 from reputable international and national organizations, including the World Bank (WDI), African Development Bank, International Energy Agency (IEA), Central Bank of Nigeria (CBN), Nigerian National Petroleum Company (NNPC), Debt Management Office (DMO), Climate Bonds Initiative (CBI), and the Federal Ministry of Finance. We also examined policy frameworks like the Energy Transition Plan (ETP) and the National Renewable Energy and Energy Efficiency Policy (NREEEP) to better understand the regulatory landscape.

These sources provide reliable evidence regarding macroeconomic conditions, energy sector performance, financing trends, and policy directions. For our analysis, we developed three key financing indicators: Foreign Direct Investment (FDI), Development Finance (DFI), and Green Bond Financing (GBF). In parallel, we evaluated energy security performance through metrics such as electricity access, the proportion of renewable energy in the overall energy mix, installed generation capacity, and qualitative assessments of supply reliability sourced from official sector reports and regulatory publications.

We carried out a quantitative analysis using SPSS (version 27) and Microsoft Excel. To spot trends over the study period, we applied descriptive statistics and trend analysis. We also used Pearson correlation to get a preliminary understanding of the relationships between financing variables and electricity access. Next, we estimated a multiple regression model to explore how foreign direct investment (FDI), domestic financial investment (DFI), and government-backed financing (GBF) impact energy security outcomes. To ensure our data was stable, we subjected all variables to Augmented Dickey–Fuller tests, and we checked the

[1] Andreas Goldthau, Benjamin Savacool, *The uniqueness of the energy security, justice, and governance problem. Energy Policy*, 2012, https://doi.org/10.1016/j.enpol.2011.10.042 (18.10.25)
[2] Güler Aras, *Sustainable Finance for Sustainable Development*, 2024, p.98

model's validity through standard diagnostic procedures, including tests for multicollinearity, autocorrelation, heteroskedasticity and specification error.

These steps help reinforce the internal consistency of our findings, aligning with the journal's emphasis on methodological transparency. On the qualitative side, we conducted a thematic analysis of important policy documents, national energy strategies, and regulatory communications. This analysis allowed us to pinpoint recurring themes around institutional readiness, financing innovation, governance coherence, and the challenges of policy implementation. The qualitative insights enrich our statistical findings by shedding light on the structural conditions and policy hurdles that influence how effectively financial flows can enhance energy security. By merging quantitative data with qualitative policy insights, this study offers a comprehensive view of how financial mechanisms are driving Nigeria's journey toward energy security.

Results and Discussion

Table 1 presents the trends in energy financing and key energy security indicators in Nigeria between 2010 and 2024, revealing distinct trajectories across Foreign Direct Investment (FDI), Development Finance Commitments (DFI) and Green Bond Financing (GBF) and their collective influence on energy security outcomes. FDI inflows averaged about US$4.6 billion annually, peaking at US$7.1 billion in 2012 before declining sharply following the 2014 oil price crash due to investor uncertainty driven by macroeconomic instability, pipeline vandalism, and policy ambiguity prior to the enactment of the Petroleum Industry Act (PIA) in 2021. Although investor confidence improved thereafter, with inflows rising to US$4.8 billion in 2024, investments remain predominantly focused on fossil fuel exploration, while renewable energy accounts for less than 10% of total energy FDI.[1]

In contrast, commitments from multilateral and regional development finance institutions, notably the World Bank, African Development Bank (AfDB) and Power Africa Initiative, expanded steadily from US$0.82 billion in 2010 to US$3.1 billion in 2024, targeting off-grid electrification, mini-grids and energy access programs. Despite their significant role in supporting energy diversification, the effectiveness of these funds has been limited by bureaucratic bottlenecks, weak project monitoring and insufficient domestic co-financing. Nigeria's sovereign green bond issuances in 2017 and 2019, totalling ₦25.7 billion (approximately US$70 million), represented a pioneering effort toward sustainable finance in Africa, funding solar, afforestation and low-carbon transport projects.[2]

However, the scale of these initiatives remains small relative to Nigeria's annual energy investment needs, estimated at US$10 billion [3] and expansion of the green finance market has been hindered by inadequate regulatory frameworks and low investor awareness. Over the same period, electricity access increased from 47% to 63%, the renewable energy share rose modestly from 13% to 18% and installed generation capacity expanded from 8,600 MW to 13,400 MW.[4] These improvements coincide with the gradual rebound of FDI and the steady growth of development finance flows, yet progress remains insufficient to meet the

[1] John Creswell, Vicki Plano Clark, *Designing and conducting mixed methods research*, 2018, p.65-96
[2] Federal Ministry of Power, *National Renewable Energy and Energy Efficiency Policy (NREEEP)* 2015, Abuja: Federal Republic of Nigeria
[3] African Development Bank, *Just Energy Transition Investment Plan (JET-IP) for South Africa: Financing a low-carbon and inclusive future*, 2023
[4] Federal Ministry of Environment, *Nigeria's Green Bond Programme: Investing in our common future*, 2020s

country's rapidly rising energy demand, underscoring the need for deeper financial, institutional, and policy integration to achieve sustainable energy security.[1]

Year	FDI (US$ bn)	DFI Commitments (US$ bn)	Green Bonds (₦bn)	Electricity Access (%)	Renewable Share (%)	Generation Capacity (MW)
2010	6.5	0.82	0.00	47	13.0	8,600
2012	7.1	1.10	0.00	49	13.2	8,900
2014	5.9	1.35	0.00	51	13.8	9,200
2016	3.2	1.75	0.00	52	14.0	9,600
2017	2.8	1.82	10.7	53	14.5	10,200
2019	3.5	2.30	15.0	55	15.2	10,800
2021	3.9	2.55	0.00	57	16.0	11,400
2022	4.1	2.75	0.00	58	16.5	12,000
2023	4.5	2.90	0.00	60	17.0	12,800
2024	4.8	3.10	0.00	63	18.0	13,400

Table 1. Trends in Energy Financing and Security Indicators (2010–2024)[2,3,4,5,6]

Correlation Results

A Pearson correlation analysis examined the relationship between financing variables and energy security indicators.

Variables	Electricity Access	Renewable Share	Generation Capacity
FDI	0.62	0.21	0.58
DFI Commitments	0.74	0.49	0.71
Green Bonds	0.52	0.67	0.46

Table 2. Correlation Matrix of Financing Mechanisms and Energy Indicators[7]

The results revealed several significant relationships among the variables. Foreign Direct Investment (FDI) shows a moderate positive correlation with electricity access (r=0.62) and generation capacity (r=0.58) thus indicating that foreign investments have primarily supported power generation infrastructure rather than promoting energy diversification. Development finance exhibits a strong positive relationship with all energy indicators, particularly electricity access (r=0.74) which highlights its central role in enhancing inclusive energy access across Nigeria. Although limited in scale, green bond

[1] International Energy Agency, *Africa Energy Outlook 2023: Securing Africa's energy future*
[2] World Bank, *Accelerating sustainable and clean energy access transformation (ASCENT) in Eastern & Southern Africa* [Fact sheet]
[3] AfDB, *Op. Cit.*, p.18-23
[4] IEA, *Op. Cit.*, p.70-78
[5] Central Bank of Nigeria, *Central Bank of Nigeria half-year economic report, 202*
[6] Bose Satyajit, Dong Guo, Simpson Anne, *Financing Clean Technology Innovation and the Transition to Renewable Energy. In: The Financial Ecosystem*, Palgrave Studies in Impact Finance. 2019 https://doi.org/10.1007/978-3-030-05624-7_14 (21.10.25)
[7] Author's computation (SPSS, 2025)

financing demonstrates a strong correlation with the renewable energy share (r=0.67), emphasizing its potential to accelerate clean energy deployment if adequately expanded.

Regression Summary

An exploratory regression model was estimated using electricity access as the dependent variable: $EAR=\alpha+\beta1(FDI)+\beta2(DFI)+\beta3(GBF)+\epsilon$. The exploratory regression model, which looks at electricity access as the dependent variable and uses financing indicators as predictors, yielded an R^2 value of 0.71. This means that Foreign Direct Investment (FDI), Development Finance Commitments (DFI), and Green Bond Financing (GBF) together account for about 71% of the differences in electricity access during the study period. This relatively strong explanatory power highlights the importance of financing mechanisms in understanding Nigeria's energy security outcomes. The findings reveal that Development Finance (DFI) has the most significant and statistically relevant impact on electricity access ($\beta \approx 0.54$, $p < 0.05$).

This emphasizes the developmental focus of concessional financing, especially in areas like rural electrification, expanding transmission networks, and fostering public-private partnerships. FDI also plays a notable role, albeit a bit more moderate ($\beta \approx 0.36$, $p < 0.10$). Its impact seems to vary over time, partly due to Nigeria's vulnerability to global commodity trends and the prevalence of fossil-fuel investments, which limits its effectiveness in promoting sustainable energy access. Meanwhile, Green Bond Financing, although still in its early stages, shows a positive but smaller influence ($\beta \approx 0.18$), reflecting the relatively limited number of sovereign issuances so far. Nevertheless, its growth trajectory indicates a promising potential for enhancing renewable energy capacity and achieving long-term decarbonization goals.[1]

Model diagnostics have confirmed that the estimates are statistically reliable. When the Variance Inflation Factor (VIF) values are below 3.0, it effectively rules out any issues with multicollinearity. Additionally, the Durbin–Watson statistic, which is around 1.95, suggests that there's no autocorrelation present. The Breusch–Pagan test indicates that heteroskedasticity isn't statistically significant, and the RESET test implies that the model's functional form is correctly specified. All these diagnostic results bolster our confidence in the robustness and validity of the regression findings. When we look at the results, it becomes clear that the structure and quality of financial resources are just as crucial as their sheer volume when it comes to determining energy-security outcomes.

The prominence of Development Finance Institutions (DFI) highlights their alignment with long-term developmental goals, while the more modest role of Foreign Direct Investment (FDI) points to structural challenges within Nigeria's investment landscape, such as regulatory uncertainties and limited private-sector involvement in the renewable-energy sector. Although green bonds are still relatively small in scale, they represent a significant opportunity for clean-energy financing. To maximize their impact, Nigeria will need to broaden the range of eligible green projects, enhance its green-finance framework, and boost investor confidence through stable regulatory and fiscal incentives. In summary, these findings resonate with broader evidence from developing countries, indicating that energy security is influenced not just by investment flows but also by the institutional, governance, and policy environments that shape how these resources are mobilized and utilized.[2] Ongoing challenges like regulatory inconsistency, poor coordination among energy institutions, and

[1] Bose et al., *Op. cit*., p. 154
[2] Goldthau et al., *Op. cit*., p. 238

governance issues continue to hinder Nigeria's energy transition and restrict the full potential of available financing mechanisms.

International and Comparative Perspective

A comparison with other African energy-transition experiences highlights the structural financing gaps that constrain Nigeria's progress. Kenya derives more than 80% of its electricity from renewable sources, a success driven by sustained concessional finance and strong private-sector participation in geothermal development. South Africa has taken a different but equally ambitious path through its Just Energy Transition Investment Plan (JET-IP), which initially mobilized US$8.5 billion in climate-finance commitments under the broader Just Energy Transition Partnership (JETP). Although full implementation requires an estimated US$98 billion between 2023 and 2027[1], the framework demonstrates a clear and coordinated approach to coal phase-out and renewable-energy expansion.

In contrast, Nigeria's financing landscape remains underdeveloped, characterized by limited penetration of green finance, slow regulatory reforms, and continued dependence on oil revenue, which reduces fiscal flexibility and delays diversification. Nonetheless, with its large domestic market, geopolitical relevance, and policy initiatives such as the Energy Transition Plan (2022), Nigeria holds significant potential to strengthen its role in West African energy security provided it can realign its financing architecture toward sustainable development objectives.

Conclusions

The findings from this study highlight that energy security in Nigeria goes beyond just being an economic goal; it's a vital strategic necessity that has significant implications for the country's stability and growth. While financial investments whether they come from foreign direct investment (FDI), development finance institutions (DFIs), or green capital markets are crucial, the results emphasize that the success of these investments largely hinges on how resources are allocated, governed, and managed. Development finance has positively impacted electricity access, but FDI remains heavily focused on fossil-fuel projects, leaving renewable energy in the shadows. Although Nigeria has made some initial strides in green finance, like issuing sovereign green bonds, the current scale and regulatory backing are still lacking to drive meaningful change.

To achieve sustainable energy security, Nigeria needs more than just an influx of capital; it requires well-thought-out institutional reforms, consistent regulations, and better coordination among key players like the Ministry of Power, NERC, and the REA. Creating a unified National Green Finance Framework would help clarify which projects qualify, improve disclosure standards, attract a wider range of investors, and integrate environmental, social, and governance (ESG) principles into financial decisions. Implementing targeted incentives such as investment tax credits, feed-in tariffs, risk-sharing guarantees, and Renewable Energy Investment Zones could steer FDI towards solar, wind, hydro and other renewable energy sources.

Additionally, enhancing project monitoring through digital platforms, boosting transparency, and establishing a dedicated Energy Finance and Investment Coordination Unit

[1] African Development Bank, *South Africa – Combined Country Strategy Paper 2023–2028 and Country Portfolio Performance Review 2023* (Abidjan: African Development Bank Group, 2023), https://www.afdb.org/sites/default/files/documents/projects-and-operations/south_africa_-_combined_country_strategy_paper_2023-2028_and_country_portfolio_performance_review_2023.pdf (14.11.2025)

would streamline governance and improve accountability. Institutional reform is crucial for enhancing coordination and efficiency within the energy sector. Right now, agencies like the Ministry of Power, the Nigerian Electricity Regulatory Commission, and the Rural Electrification Agency often operate in silos, which leads to overlapping efforts and gaps in policy. Establishing a central Energy Finance and Investment Coordination Unit could help bring these activities together, simplify project approvals, and promote transparency. Additionally, utilizing digital monitoring tools and making energy data accessible to the public would boost accountability and foster investor confidence.

International partnerships are vital for Nigeria's energy transition. Collaborating with organizations like the World Bank, African Development Bank, Green Climate Fund, and Power Africa Initiative can provide Nigeria with access to concessional financing and valuable technical expertise. Being actively involved in regional initiatives such as the ECOWAS Power Pool would enhance energy trade and bolster regional stability. By broadening diplomatic and financial cooperation, Nigeria can tap into blended finance and engage more effectively in global climate efforts.

International and regional collaboration is going to be key. By strengthening ties with organizations like the AfDB, World Bank, GCF and Power Africa, and by getting more involved in the ECOWAS Power Pool, Nigeria can access concessional finance, leverage global technical know-how, and boost regional energy stability. Aligning national energy strategies with global commitments like the Paris Agreement, SDG 7 for affordable and clean energy, and SDG 13 for climate action will enhance Nigeria's credibility and improve its access to global climate finance. In the end, this study shows that Nigeria's long-term energy security hinges on a comprehensive approach that blends diverse financing, strong institutions, transparent governance, and strategic international partnerships. A resilient and sustainable energy system will not only fuel industrial growth but also help reduce poverty, foster social inclusion, tackle regional inequalities, and bolster national security. By cutting down on fossil fuel reliance, promoting green finance, empowering institutions, and embracing global climate frameworks, Nigeria can speed up its journey toward a stable, fair, and sustainable energy future.

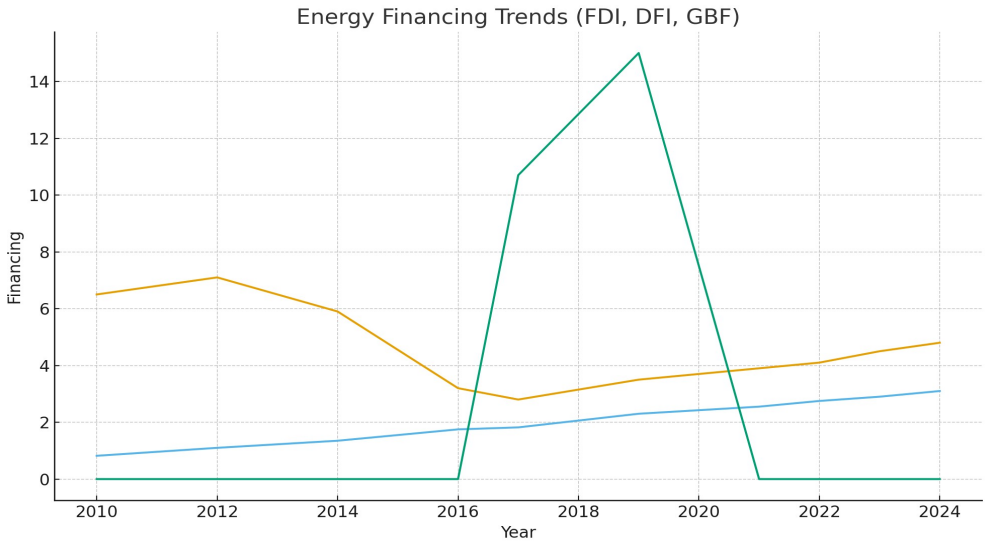

Figure 1. Investment and Financing Trends[1]

[1] Authors' computation (Microsoft Excel)

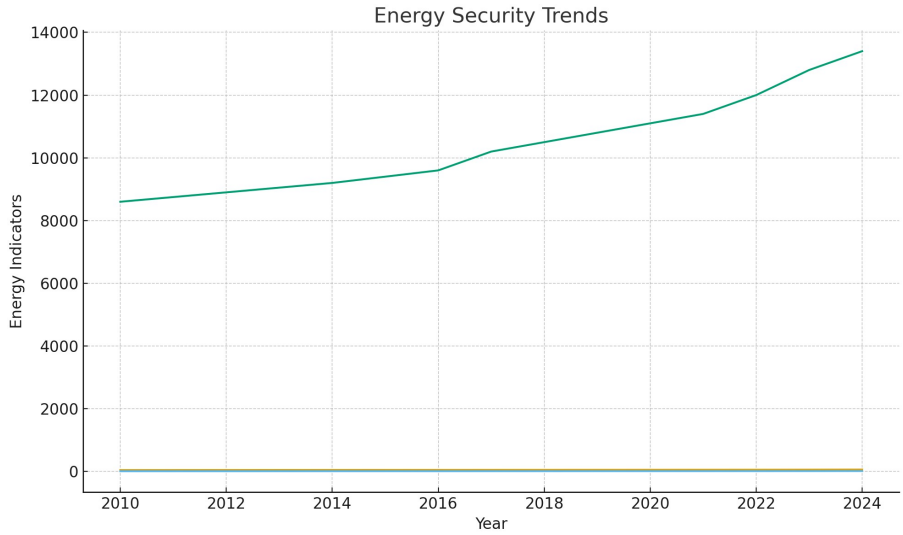

Figure 2. Energy Security Indicators[1]

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