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Mobilising Private Capital for Green Energy Investments in Nigeria

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INTRODUCTION

Nigeria is Africa's most populous nation and is expected to be amongst the world's top 20 economies by 2020. However, the nation's potential for economic development is undermined by inconsistent and the high cost of power supply. Experts estimate that the lack of adequate power generation costs Nigeria up to the US \$250 billion¹ each year. This has hindered its industrial development. In terms of infrastructure development nothing has changed in Nigeria in over past 10- 20 years, and there has been very little holistic planning with regards to electrical grids. Currently, less than 40% of the country is connected with the national grid, leaving more than 60% of primarily rural residents with absolutely

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no access to energy. Moreover, most power generation is done in the southern and middle part of the country, with almost no power generated in the northern part. This is regrettable as Northern Nigeria has enormous solar energy potential. Theoretically, the region has the potential to generate 1850×10^3 GWh of solar electricity per year, which is over one hundred times the current grid electricity consumption level in the country.¹⁴

In view of this, diversifying Nigeria's energy economy by leveraging renewable energy technologies was given priority by several administrations since the country's independence in 1960. Yet, the issue is still at the teething stage, despite several international agreements signed on climate change and the adoption of renewable energy to mitigate its risks. Additionally, through the ratification of the ECOWAS Renewable Energy Policy, the Nigerian government has attempted to demonstrate a commitment to increasing the percentage contribution of solar energy to the total energy mix and to ensuring a minimum electricity contribution of 16% by 2030.

In 1992, the Energy Commission of Nigeria (ECN) began drafting the first edition of the National Energy Policy that included renewable energy technologies and energy efficiency best practices. The first energy policy was approved in 2003 and the most up to date document is the 2014 National Renewable Energy Master Plan. This plan aims to increase energy supply in the country through diversification of energy source, provide access to energy to people in rural communities and mitigate the impact of climate change. However, despite considerable efforts by the government and stakeholders to enhance the energy supply, the country continues to have low renewable energy generating capacity due to several challenges hindering investment and growth in the sector.

The primary concern for investors looking at Nigeria for potential investments is the nation's history of policy shifts. Additionally, the volatility of the Nigerian Naira, the national currency, also acts as a deterrent. Investors are concerned about the impact of both issues on their ability to recoup their investment and make a profit, especially because currency volatility makes access to foreign exchange and repatriation facilities difficult at times.

A secondary concern revolves around the sanctity of contracts. Nigerian generation and distribution companies are owed a significant amount of money by the government. The prospective investor looking into the market is discouraged by these liquidity challenges.

The third important deterrent is an access to debt financing. Local banks have extremely high interest rates for credit facilities and are generally unwilling to provide funding for projects that take more than four years to repay, whereas, capital intensive industries like energy usually require 15-20 years. As a result, most investors and entrepreneurs are forced to rely on their own capital, bootstrapping or other funding areas.

The fourth barrier is affordability. The tariffs on renewable energy are higher than on traditional energy and the initial setup costs are high. This makes the

business case for investing in renewable energy harder for government and citizens to reconcile.

In addition to greater capital costs, renewables are seen as an unproven technology and as such investors face higher uncertainty and perceived risk in their investments. As a result, in a country like Nigeria, which has stiff competition for the limited supply of capital, renewable developers face greater costs.¹⁹ This lack of information and awareness has also created a market gap that results in a higher risk perception for potential renewable energy adopters. Only a few people in the country know that renewable technologies can fulfill their energy needs. Those who are informed are more worried about the quality and capacity of the technology.

This paper, part of the Observer Research Foundation's Financing Green Transitions series, will provide an overview of Nigeria's current energy mix, and highlight the various risks perceptions associated with mobilizing private capital for clean energy and infrastructure investments.

OVERVIEW OF THE ENERGY SECTOR IN NIGERIA

Coal, Nuclear, geothermal, tidal, wind and solar energy are minimal parts of Nigeria's energy mix, as they have either been neglected, not discovered or are currently at the early stages of development.⁶ Over-dependence on subsidized oil and gas as primary energy sources has slowed down the development of renewable energy in Nigeria.⁷

The country imports more than 70 percent of domestic fuel requirements because of inefficiency on the part of the nation's four refineries. Consequently, availability of power in the country varies from about 27% to 60% of installed capacity. Additionally, transmission and distribution losses are sizeable – up to 28% of the electricity generated by the country.

The average household receives approximately 6 hours of power generation a day. Electricity is largely supplemented by private producers or the use of individual generators powered by fossil fuel for the privileged classes. Over 90% of businesses and companies have private generators, leading to high production costs.³ The majority of electricity generation in Nigeria comes from thermal power plants (79%), with about two-thirds of thermal power being generated from natural gas and the rest from oil. Hydroelectricity (21%), is the only other source of power generation.⁵

The Energy Commission of Nigeria (ECN) has published analysis demonstrating possible ways to meet the 16% renewables target by 2030 as part of the Nigerian Renewable Energy Roadmap (NREAP) in 2012. This analysis indicates that delivering 16% renewable energy by 2030 is feasible and could be achieved in the following proportion: Small hydropower 7.07%; Solar 5.90%; Biomass 2.78%; and Wind 0.25%.¹³

NIGERIAN ELECTRICITY REGULATORY COMMISSION (NERC)

In 2008, the Nigerian Electricity Regulatory Commission (NERC) created a Multi-Year Tariff Order (MYTO) to provide power industry with a cost-reflective pricing structure with a modest profit. Based on the data provided by the generation, transmission and distribution (DisCo) companies, NERC developed MYTO to set wholesale and retail prices for electricity. The Tariff Model used in the MYTO is based on the costs and the amount of electricity produced and aims to calculate a tariff that is both profitable enough for the electricity companies and reasonable for the end customers.

In 2016, the NERC introduced regulations for mini-grids to address concerns and barriers to rural electrification investments by enabling the provision of permits which streamlined projects and provided optional permits. The benefits of securing a permit from NERC include entitlements to exit compensation and a secure tariff based approved model. Additionally, the new regulations provide an exclusivity period giving developers the legal right to reserve a site and permission to charge cost-reflective tariffs subject to the demonstration of sufficient progress. Mini-grid regulations also put in place a dispute resolution framework, mechanisms ensuring the quality of service, and options for eventual integration into the main-grid.

The tariff methodology for the MYTO and the MYTO Mini Grid is same. However, due to the size differences in projects, some adjustments were made. For example, only the generation and distribution sections of the MYTO are used, as there is no need to consider transmission tariffs. Furthermore, tariffs are calculated separately for clusters of villages that are located in the same area. There is also no customer classification imposed by the NERC for off grid mini-grids as compared the five tier system used for generation and distribution companies on the national grid. Finally, to secure investments, allowable technical and non-technical losses have been capped at 10%.

NERC offers two distinct development processes for isolated mini-grid development processes versus interconnected permit processes.

For isolated projects, the following steps must be completed:

1. Identify a site outside of disco's approved expansion plan
2. Establish contact with the community
3. Sign 12 month exclusivity agreement with the community
4. Collect building permits from the municipality, and from the Ministry of Environment
5. Apply to NERC for permit or registration (as required) and tariff approval
6. Install, commission, operate

For interconnected projects the following steps must be completed:

1. Identify site
2. Sign exclusivity agreement
3. Sign a tripartite agreement between mini grid developer, the community, and the distribution company and then collectively agree to work on network usage fees and usage conditions.
4. Obtain approval of tripartite agreement/permit from NERC
5. Install, commission, & operate the mini-grid system

These easy to follow step by step processes are designed to attract investment and speed up the electrification of Nigeria's urban regions.

To augment investor confidence, when distribution companies are ready to take over the mini-grid they are obligated by the NERC to compensate the mini-grid company with the value of the network plus an additional year of revenue. There is also an existing option for the mini-grid to take away its generation facility or become an embedded/emergency generator.

BARRIERS TO PRIVATE CAPITAL INVESTMENTS

Financial Risk

Lack of required infrastructure and the poor condition of the available infrastructure has pushed up average initial capital costs for clean energy investments in Nigeria.²⁰ The issue is further compounded with the cost of equipment and installation being greater in the short run for renewable projects compared to non-renewables, especially in Nigeria where investors must rely on imported components in the absence of local capacity. These additional costs can be challenging for companies investing in a developing country like Nigeria. Despite the fact that renewables prove to be cheaper in the long run with lower operational and maintenance costs, many are reluctant to make initial investments.

Local as well as international banks are also not willing to take the risk in Nigeria and as such securing guarantees are a big problem. This may also have a lot to do with Nigeria's reputational challenges. Nigerian banks typically fail to provide sufficient long-term debt financing, with financing for energy projects beyond 5-7 years being rare. While this is slowly shifting for Independent Power Producers, securing the banks' support with long-term Naira denoted debt remains a challenge, with such debt being preferred due to the Naira denominated revenue the companies earn.¹⁸

Furthermore, many investors, having borrowed money to finance their investment, find that extending their loans and obtaining continuing finance is

difficult. The only exceptions are the arms of development financing institutions like Deutsche Development Bank, where one can obtain debt relatively cheaply. However, these loans often come with very strict requirements based on international best practices and require projects to have appropriate environmental protections. This requires investors to have experts with the appropriate industry experience which is often hard to find in Nigeria. Additionally, many investors believe that the Nigerian government does not really understand where they need the power to be generated and where it should go. As it stands, the investors are exposed to heightened risks in case of a government change.

Further, debts have endangered the electricity value chain as generation companies suffer a cash liquidity crisis which jeopardizes their payment to suppliers. This revenue shortfall also affects the ability of distribution companies to make much needed investments in their electricity distribution infrastructure, such as in network development and metering.

Difficulties relating to the repatriation of money and finding appropriate currency brokers often create issues relating to access to foreign currency. Exchange rate instability also augments the financial risk because almost all tools are purchased abroad using FOREX. Inflation is also a risk factor, which Nigeria is presently experiencing due to crashing prices of fossil fuel, as it is a nation that depends largely on oil. Corruption also increases financial risks, even though the Buhari administration continues to address this issue aggressively. Fluctuations in the prices of commodities sourced from the Nigerian market have also had a negative effect on green projects, presenting even greater financial risk. For example, after negotiations for a project were completed and fees were agreed on, spikes in the price of products and commodities needed can severely cut into the profit margins of investors.

Information Risk

In Nigeria, a lack of knowledge pertaining to renewable energy is a concern for international investors as there is a widespread technical ineptitude. Informational issues arise as the government often lacks comprehensive datasets. This has resulted in further uncertainty for investors when attempting to address the quality and value of existing assets. The debate is derived from the required investment needed in the assets to ensure their supposed quality with neither side willing to put in such great amounts of capital in upgrading the assets.

A lack of knowledge in the economy about such things acts as a deterrent to investment, as the upkeep and management of renewable technologies, for example, is reliant on a few individuals with the necessary skills. The absence of such information and expertise discourages large projects or a series of investments.

The National Power Training Institute of Nigeria (NAPTIN) is an agency of the Federal Government of Nigeria, operating under the aegis of the Federal Ministry of Power. It was established on 23rd March 2009 and commenced full operation in September 2009. The primary purpose of its establishment was to provide training for power sector personnel and coordinate training activities in the sector. That skill gap still remains to be bridged. This issue is unlikely to be resolved in the near future as the majority of schools as well as media fail to publicise such technologies. This makes it difficult for renewable energy sources to be adopted as a true successor in power generation within the foreseeable future.³² Specifically, information is inadequate about the great social, economic and environmental benefits as well as regarding the dissemination and diffusion of renewables and their applications.³³

Furthermore, as long-term economic and environmental benefits to the local communities are major attractions of launching renewable energy ventures, lack of awareness of such technologies and their benefits may result in inefficient uptake of new technology, particularly so when renewable energy may initially be more expensive than fossil-fuel energy. Without local support and maintenance, a renewable energy project can prove to be unviable. Therefore this informational gap can be an investment barrier.

Fraud Risk

Fraudulent activities by consumers also discourage investors as it affects revenue collection.²⁹ Direct hooking is the most common method for electricity theft in which a clandestine consumer connects to power without the distribution company's permission. This is done by tapping into underground cables often ahead of an energy meter, so the electricity stolen can't be measured or turned off so easily. This can also be termed meter bypass. However, the term can also allude to direct interference through shorting the wire in the meter as well. A more technical innovation is to place a transistor or resistor inside the meter, causing a lower reading of electricity use – this can also be harder to detect.³⁰ Similarly, holes can be drilled into an electromechanical meter to tamper with the meter's workings and corrupt electricity officials can fix customers' bills or allow illegal connections to the grid for bribes. These methods lead to losses for electricity providers whilst presenting issues for their distribution systems. These issues discourage investors and entrepreneurs from investing their resources in energy generation, renewable or otherwise, as they can't effectively create business plans with such uncertainty about their income stream.³¹

Policy Risk

A clear policy framework consisting of legal, regulatory and fiscal instruments is needed to attain significant renewable energy progress and bring in the required

private sector investment. The implementation of policies at the federal, state and local government level necessitates long-term political support to ensure the development of renewable energy. Whilst energy policies, as outlined earlier, have been created by the government, their follow-up and active execution have been lacking.³⁴ Essentially, although thorough policies may be devised, they might not be adopted or correctly enacted.³⁵ This breeds policy uncertainty, currently seen with the renewable energy buyback scheme and particularly with feed-in tariffs: commercial, residential and future. In general, compliance measures and standards are inconsistent for issues such as metering guidelines and clean energy efficiency requirements.³⁶ Another issue hampering the growth of renewable technologies in Nigeria concerns weak and vague legislation regarding standards, quality, and control of domestically manufactured technologies and imports.³⁷

Nigerian renewable energy generation presently lacks a plan for clean energy sources to connect to the grid which acts as a barrier to the continued expansion of renewables. They define the price, quality, schedule and the terms of agreement of a contract as well as penalties for breaking it.³⁸ Additionally, investor issues exist with government power purchase agreements (PPA) - primarily with the tariff and counterparty credit risk, but also with the relative lengths of the PPA, financing terms and the commercial viability of the terms.³⁹ PPAs need to be of a long-term nature and backed by legislation to give security to renewable energy providers and their financial investors to invest further in the growth of renewable energy in Nigeria. Whilst the Nigerian Bulk Electricity Trading Company (NBET) offers investors a degree of security with regards to PPA counterparty risk, uncertainty still arises with the Federal Government of Nigeria's (FGN) plan of transitioning to a wholesale market. This is amplified by the expiration in 2021 for the NBET's bulk purchase and resale license.⁴⁰

Solutions/Recommendations

The Federal Government of Nigeria (FGN) has made it clear that it is committed to supporting and advancing the integration of various renewable energy projects and technologies, such as grid extensions and off grid mini grids.⁴¹ Furthermore, the FGN has stated that it will promote private sector participation in rural electrification (on- and off-grid) in the development of the nation's abundant renewable energy resources. The government needs to develop good policy and legal frameworks that will attract investors—foreign and domestic—and also set standards. Regulators need to be consistent and fair; signed contracts need to be respected; mobile courts need to be erected to discourage power theft; and key sector stakeholders need to collaborate in a productive manner.

To mobilize private capital for renewable energy projects, improvements to the financing and regulatory environments are also necessary. Advancements on this end are already underway as seen by one example, in which the Rural Electrification Agency (REA) is currently setting up the procedure for project

developers to access grant financing from the Rural Electrification Fund (REF) department of the REA. The agency will also offer technical expertise to project developers. Both interventions are available for developing projects specifically for rural electrification. Also, the Nigerian Bulk Electricity Trading (NBET) has made available a put and call option agreement (PCO) to renewable energy developers which provides that in the event of termination, the government will acquire the assets of the investor to ensure all debts are paid and shareholders recover their funds, subject to the original reason for termination.

To attract investment into this sector, an investor needs adequate information before they can make the informed business decision to invest in the country. Lack of awareness about environment-friendly projects is a challenge. Socio-cultural beliefs and practices may discourage investments in climate action projects as well. This sector is grossly underreported and underestimated and this poses a problem for any investor. To combat the complaint of inadequate information, government, who is seen as the regulator, should embark on extensive research to identify environmental issues. Greater media visibility on climate action projects, emphasizing high returns on investment and greater impact on health and environmental benefits, is needed. Private-public partnership for the dissemination of information on renewable energy, specifically its benefits and opportunity to the general public, is needed in order to raise public awareness. Furthermore, development of an investor's manual can help prospective investors understand the process from A-Z and will help him avert expensive mistakes.

To build investor confidence, Nigeria needs to fix the liquidity challenges in the power distribution sector and allow existing contracts to work. All investors should know with confidence that if they invest their money, produce power, and sell at a fair price, they will earn back their money with profit. This will also have a multiplier effect in reducing requests for securities and guarantees. Recently, the Federal Executive Council approved that CBN should approve a fund of N701 billion to be spent over a period of two years. The fund ensures that every month Nigerian Bulk Electricity Trading (NBET) pays a minimum of 80% of the invoice. This is a step in the right direction because investors want to see the progression towards a fair market. Debts will always exist but the key is to ensure that it does not eat into people's capital investments. Without these guarantees, no amount of convincing will encourage investors to invest.

Nigeria needs more fiscal and economic incentives to attract local and foreign investment like Kenya and Tanzania. The two African countries offer incentives for renewable energy companies such as tax exemptions and custom duties concessions. Despite pioneer tax status and exemptions on duties for the importation of solar panels, other items in solar kits including batteries are still subject to taxation. This incongruity results in high cost of taxation and importation in Nigeria making the end price of renewable energy to the consumer amongst the highest in Africa. In addition, the local process for getting a generation licence could be better aligned with what international financiers

expect. NBET has given out generation licences but it's very expensive to develop sites. The government should take a more proactive approach and do the initial work themselves i.e. documentation should be templated. Currently, the developer drafts their own PPA so there are so many variations.

Lastly, renewable energy technologies are new to Nigeria and as such there is no concrete legislation for it. It's something that all stakeholders, developers, regulators, and the government are currently developing together. Each regulator has different issues. For the Transmission Company of Nigeria (TCN) there are issues in understanding the nature of the energy that is generated. Their main concern is how renewable sources like solar will react with their grid and how it will affect the network in general. Therefore, they require developers to safeguard against any potential disruptions. With government, from a financial perspective, they are highly concerned with the cost of acquisition, since solar is a technology we have to import, and the cost of tariffs leads them to question what the value of solar is to Nigeria. 

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