



**CHALLENGES FACING RENEWABLE ENERGY (RE) IN  
NIGERIA AND THE GOVERNMENT'S ROLE IN  
UNLOCKING PRIVATE INVESTMENT**

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## **CHALLENGES FACING RENEWABLE ENERGY (RE) IN NIGERIA AND THE GOVERNMENT'S ROLE IN UNLOCKING PRIVATE INVESTMENT**

Oluwatobi Fagbemi\*

### **ABSTRACT**

*Renewable energy is an important panacea for the environmental problems produced by fossil fuels. However, its deployment is critical in ensuring its advantages. The Government alone cannot completely implement such deployment. Therefore, private investment is required.*

*This paper investigates the role of the Government in facilitating private investments in renewable energy. Private investments can make major contributions to deploying and developing renewable energy. However, the key risks associated with private investments in renewable energy, like financial fraud, and regulatory risks, negatively impact private investors' willingness to participate in Nigeria's renewable energy. As such, renewable energy's slow development rate makes it difficult for the Government to meet its renewable energy usage targets.*

*The Government must, ensure, recognise, and harness the potential that private investment can provide for renewable energy. The paper emphasises the vulnerabilities of the renewable energy sector and suggests that the Government develop initiatives to encourage private investment.*

### **1.0 INTRODUCTION TO RENEWABLE ENERGY IN NIGERIA**

With proper investment and commitment, Nigeria's renewable energy resources can place her among the nations excelling in that regard. This is because Nigeria is blessed with many renewable energy sources.

As far back as 1989, Onyebuchi<sup>1</sup> appraised the technical potential of solar energy in Nigeria with a five percent device conversion

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<sup>1</sup> E. Onyebuchi, "Alternative Energy Strategies for the Developing World's Domestic Use: A Case Study of Nigerian Household's Final Use Patterns and Preferences" (1989) 10(3) *The Energy Journal*, 121-138.

efficiency set at  $15.0 \times 10^{14}$  kilojoules (kJ) of useful energy per year. The potential is about 258.62 million barrels of oil equivalent annually, in line with the country's annual fossil fuel output. This potential will also equate to approximately  $4.2 \times 10^5$ -Gigawatt hour (GWh) of annual electricity production, about 26 times the country's yearly electricity production of 16,000 GWh.

In their assessment, Chineke and Igwiro<sup>2</sup> revealed that Nigeria obtains ample solar energy that the country can judiciously exploit with an annual average daily solar radiation of about 5.25 kilowatt-hours per square meter (kWh/m<sup>2</sup>/day). The daily solar radiation ranges between 3.5 kWh/m<sup>2</sup>/day in the coastal areas and 7 kWh/m<sup>2</sup>/day at the northern margin. The standard aggregate of sunshine hours across the country was about six and a half hours, presenting an average yearly solar energy concentration of 1,934.5 kWh/m<sup>2</sup>/year. Thus, for a year, an average of 6,372,613 petajoules per year (PJ/year), (approximately 1,770 terawatt-hours (TWh/year) of solar energy falls throughout Nigeria. In 2008, this quantity was about 120,000 times the sum of the annual average electrical energy generated by the now defunct Power Holding Company of Nigeria (PHCN). By a 10 percent conservative conversion efficiency, the solar energy resource that will be obtained is put at 23 times the Energy Commission of Nigeria's (ECN) projection of the total concluding energy demand for Nigeria in the year 2030.<sup>3</sup>

Meanwhile, the potential of Nigeria in renewable energy is not restricted to solar power as there has been extensive research that confirms the availability of alternatives such as wind. Adekoya and Adewale<sup>4</sup> examined the wind speed data of 30 stations in Nigeria, ascertaining that the mean wind speeds and power flux densities per year oscillate from 1.5 to 4.1 metre per second (m/s) to 5.7 to

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<sup>2</sup> T. Chineke, E. Igwiro, "Urban and rural electrification: Enhancing the Energy Sector in Nigeria Using Photovoltaic Technology" (2008) 9(1) *African Journal of Science and Technology*, 102-108.

<sup>3</sup> Energy Commission of Nigeria (E.C.N.): Renewable Energy Master Plan. 2005.

<sup>4</sup> L. Adekoya, A. Adewale, "Wind Energy Potential of Nigeria" (1992) 2(1) *Renewable Energy*, 35-39.

22.5 watt per square metre ( $W/m^2$ ) respectively. Fagbenle and Karayiannis<sup>5</sup> conducted a 10-year wind data survey starting from 1979 to 1988, analysing the surface and upper winds, including the maximum gusts, while Ngala, Alkali and others<sup>6</sup> carried out a statistical evaluation of the wind energy potential in Maiduguri, Borno State, employing the Weibull distribution and 10-year (1995 to 2004) wind data. A cost-benefit study was also conducted, applying the wind energy conversion systems for electric power production and distribution in the State. All of these reviews indicate the fact that the nation is endowed with a massive opportunity for harnessing wind for electricity generation, especially in the core northern states, the mountainous segments of the central and eastern states, as well as the offshore areas, where wind is profusely available round the year.

The matter, then, is for the country to consider exploiting resources to set up wind farms in the different regions and zones that can harvest wind energy.<sup>7</sup> Akinbami<sup>8</sup> detailed that the entire hydroelectric power potential of the country was approximated to be around 8,824 megawatts (MW) with a yearly electricity production potential of more than 36,000 GWh. This potential comprises 8,000 MW of massive hydropower technology, while the residual 824 MW remains small-scale hydropower technology. Currently, 24 percent and 4 percent of both large and small hydropower potentials in the country have been utilised. Akinbami, Ilori and others<sup>9</sup> denoted that Nigeria's recognised feedstock

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<sup>5</sup> R. Fagbenle, T. Karayiannis, "On the Wind Energy Resources of Nigeria" (1994) 18(5), *International Journal of Energy Research*, 493-508.

<sup>6</sup> G. Ngala, B. Alkali, M.A. Aji "Viability of Wind Energy As A Power Generation Source in Maiduguri, Borno State, Nigeria" (2007) 32(13) *Renewable Energy*, 2242-2246.

<sup>7</sup> S. Oyedepo "Energy and Sustainable Development in Nigeria: The Way Forward" available at <https://doi.org/10.1186/2192-0567-2-15> (accessed 25 July 2022).

<sup>8</sup> J. Akinbami, "Renewable Energy Resources and Technologies in Nigeria: Present Situation, Future Prospects and Policy Framework", (Kluwer Academic Publishers, Netherlands; 2001).

<sup>9</sup> J. Akinbami, M. Ilori, T. Oyebisi, I. Akinwumi, O. Adeoti "Biogas Energy Use in Nigeria: Current Status, Prospects and Policy Implications", (2001) 5 *Renewable and Sustainable Energy Review*, 97-112.

substrate for an economically attainable biogas program include water lettuce, water hyacinth, dung, cassava leaves, urban refuse, solid (including industrial) waste, agricultural residues, and sewage.

Oyedepo's perspective is that Nigeria yields about 227,500 tonnes of fresh animal waste per day. Since one kilogramme (kg) of fresh animal waste generates about 0.03 m<sup>3</sup> gas, Nigeria could supply about 6.8 million m<sup>3</sup> of biogas daily. Additionally, 20 kg of local solid waste per capita is produced yearly.<sup>10</sup> Nevertheless, Nigeria faces a poor supply of usable energy due to swiftly increasing demand, typical of a developing economy. Contrary to the latter, the country has vast sustainable energy resources. Nigeria has ample conventional energy resources, including oil, natural gas, lignite, and coal. In addition, it is rich in renewable energy sources such as wood, solar, hydropower, and wind.<sup>11</sup> Nigeria has appreciable biomass resources to satisfy traditional and modern energy uses, including electricity production.<sup>12</sup> There has been a supply and demand difference because of poor development and ineffective control of the energy sector. The country's most utilised energy resource dispensation of electricity has been fluctuant.<sup>13</sup>

## **2.0. THE RENEWABLE ENERGY MASTER PLAN (REMP)**

Nigeria's pursuit of elevating the diversification of its energy mix brought about the Renewable Energy Master Plan (REMP), endorsed by the Government in November 2005 and later reformed in 2011. The Energy Commission of Nigeria (ECN) and the United Nations

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<sup>10</sup> S. Oyedepo, "Energy and Sustainable Development in Nigeria: The way forward", (2012) *Energy, Sustainability and Society*, 2(1). doi:10.1186/2192-0567-2-15.

<sup>11</sup> E. Okafor, C.K.A. Joe-Uzuegbu, "Challenges to Development of Renewable Energy for Electric Power Sector in Nigeria", (2010) 2(2) *International Journal of Academic Research*, 211-216.

<sup>12</sup> C. Ighodaro, "Co-Integration and Causality Relationship Between Energy Consumption and Economic Growth: Further Empirical Evidence for Nigeria" (2010) 11(1) *Journal of Business Economics and Management*, 97-111.

<sup>13</sup> E. Okafor, C. Joe-Uzuegbu, "Challenges to Development of Renewable Energy for Electric Power Sector In Nigeria" (2010) 2(2) *International Journal of Academic Research*, 211-216.

Development Program (UNDP) developed this plan to create a general vision and set targets and strategies to fix the country's fundamental energy issues via speedy development and renewable energy. The REMP aims at realistic and verifiable national goals for short-term, medium, and long-term use by an inclusive structure for renewable energy policy development, legislation, technology, human resources, infrastructure, and the market. The REMP set short-term targets for 2007, medium-term targets for 2015, and long-term targets for 2025.<sup>14</sup> One of which is to increase the supply of renewable electricity from 13 percent of the total electricity production in 2015 to 23 percent in 2025 and 36 percent by 2030.<sup>15</sup> Similarly, a major target of the REMP is that renewable electricity would be the source of 10 percent of Nigeria's total energy consumption by 2025.<sup>16</sup>

## **2.1. The Barriers to the Targets of the Renewable Energy Master Plan (REMP)**

There are factors responsible for the difference between Nigeria's great potential in renewable energy production and the discouraging energy supply that has beset the nation. This section will identify the challenges mitigating renewable energy usage in Nigeria and proffer solutions to the highlighted issues.

### **2.1.1. The Absence of Applicable Laws: A Significant Problem of Renewable Energy Exploitation in Nigeria**

It has been asserted that the crucial obstacle to renewable energy exploitation is the lack of relevant laws through which the country's sustainable implementation of the renewable energy plan can be

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<sup>14</sup> C. Okonkwo, F. Edoziuno, A. Adediran, E. Ibitogbe, R. Mahamood, E. Akinlabi, "Renewable Energy in Nigeria: Potentials and Challenges" (2012) *Journal of Southwest Jiaotong University*, available at <https://www.jsju.org/index.php/journal/article/view/924> (accessed 7 July 2022).

<sup>15</sup> IEA, "Nigeria Renewable Energy Master Plan", 3 July 2013 available at <https://www.iea.org/policies/4974-nigeria-renewable-energy-master-plan> (accessed 7 July 2022).

<sup>16</sup> IEA, "Renewable Energy Master Plan", 24 August 2021, available at <https://www.iea.org/policies/4967-renewable-energy-master-plan> (accessed 7 July 2022).

attained.<sup>17</sup> The initial master plan (REMP) is a little more than a mere policy as it is short of legal backing. The lack of funding for projects, alongside the inadequacy of incentives for investments, has halted renewable energy projects and has hampered the success of REMF. The numerous impediments to the REMF's success are policy and political blocks, market reforms, international development and control barriers, research and development issues, and environmental setbacks. The necessary laws will impose zero taxes on renewable products to benefit the poorest of the poor, representing most of the Nigerian population.<sup>18</sup>

### **2.1.2. Nigeria's Unreliable Technical Capability: A Principal Barrier in the Exploitation of Renewable Energy**

Oyedepo and others<sup>19</sup> showed that the major technical challenge with wind turbines is the reliance on manufacturers to design, fabricate, and service the turbines. Meanwhile, the provision of turbines is lacking in Nigeria, creating significant gaps in the production and maintenance capacity of system components.<sup>20</sup> This problem has been worsened by situating these projects in remote areas, leading to difficulties in securing competent personnel for the work.

Other issues are poor quality of products, little or no research and development work, and the absence of human and manufacturing

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<sup>17</sup> Z. Elum and A. Momodu, "Climate Change Mitigation and Renewable Energy for Sustainable Development in Nigeria: A Discourse Approach" (2017) *Renewable and Sustainable Energy Reviews* 76, pp.72-80.

<sup>18</sup> J. Nyika, A. Adediran, A. Olayanju, O. Adesina, and F. Edoziuno, "The Potential of Biomass in Africa and the Debate on its Carbon Neutrality", available at <https://www.intechopen.com/online-first/the-potential-of-biomass-in-africa-and-the-debate-on-its-carbon-neutrality> (accessed 9 July 2023).

<sup>19</sup> S. Oyedepo, P. Babalola, S. Nwanya, O. Kilanko et. al, "Towards a Sustainable Electricity Supply in Nigeria: The Role of the Decentralised Renewable Energy System", (2018) 2(4) *European Journal of Sustainable Development Research*, Article No. 40, available at <https://www.ejosdr.com/article/towards-a-sustainable-electricity-supply-in-nigeria-the-role-of-decentralized-renewable-energy-3908> (accessed 9 July 2023).

<sup>20</sup> C. Okonkwo, F. Edoziuno, Adeolu Adesoji Adediran, E. Ibitogbe, R. Mahamood, E. Akinlabi, "Renewable Energy in Nigeria: Potentials and Challenges", (2012) *Journal of Southwest Jiaotong University*, available at <https://www.jsju.org/index.php/journal/article/view/924> (accessed 25 July 2022).

capacities to sustain present-day trends in renewable energy technologies. According to Nyika and others,<sup>21</sup> there is a lack of knowledge on local energy needs, research and development, preventing effective and reliable designs that would meet local demands. The absence of a local workforce to install and manage the equipment appropriately, the need for access to replacement parts, and the requisite understanding by the public are key hindrances towards achieving renewable energy utilisation.

### 2.1.3. **The Issue of Public Awareness and Acceptance**

Inadequate public knowledge of the prospects of renewable energy as a solution to energy and development problems in the country has deformed the market. This is because it has led to a more accepted opinion that future renewable energy projects are not dependable, thus, suitable for only smaller markets.<sup>22</sup> As noted by some authors,<sup>23</sup> the development, application, and distribution of renewable energy resources and technologies in the Nigerian energy market have been limited due to the absence of awareness of these resources' economic and environmental advantages. Akinbami<sup>24</sup> stated that this lack of awareness has disadvantaged the public, making it almost impossible to motivate the Government to create and execute plans and strategies for enhancing the growth, application, dissemination, and circulation of renewable energy resources and technologies within the national energy market. This can also be ascribed to the public perception of being trapped in the impression that the country holds an inexhaustible fount of fossil fuels (oil, natural gas, coal).

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<sup>21</sup> *Supra*, note 18.

<sup>22</sup> K. Okedu, R. Uhunmwangho, and P. Wopara, "Renewable Energy in Nigeria: The Challenges and Opportunities in Mountainous and Riverine Regions", (2015) 5(1) *International Journal of Renewable Energy Research*, 222-229.

<sup>23</sup> C. Nnaji, C. Uzoma, and J. Chukwu, "The Role of Renewable Energy Resources in Poverty Alleviation and Sustainable Development in Nigeria (2010) 3(31) *Continental Journal of Social Sciences*, 31-37.

<sup>24</sup> J. Akinbami, "Renewable Energy Resources and Technologies in Nigeria: Present Situation, Prospects, and Policy Framework", (2001) 6(2) *Mitigation Adaptation Strategies Global Change* 155-182.



#### **2.1.4. Economic and Financial Barriers; Another Key Challenge Facing Renewable Energy in Nigeria**

Economic and financial barriers have been considered as other primary obstacles to developing renewable energy systems in Nigeria.<sup>25</sup> Problems emanate from the deficiency of access to capital, lack of life support, and the absence of investment to the dearth of information supplied by relevant financial organisations. The other issues involved in financial barriers are the degree of energy systems, ill-suited government subsidies, or other agencies. Engaging in renewable power projects requires considerable resources, making it difficult to obtain financing because lenders view such projects as having a high level of risk and instead favour large-scale conventional electricity investments.<sup>26</sup> Even when such loans are obtainable, the interest charges are generally excessive, which is a disincentive to many investors.

#### **2.1.5. Other Challenges Facing Renewable Energy in Nigeria**

Social, cultural, religious, and environmental constraints have also been identified as barriers to exploiting renewable energy in Nigeria.<sup>27</sup> The gradual transition from conventional to renewable energy has sparked popular indignation and criticism due to a lack of knowledge about the benefits of renewable energy. The disturbance of water bodies and the purchase of land that many would like to use for agricultural purposes further contribute to the criticism against transitioning to renewable energy.

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<sup>25</sup> *Supra*, at 18; J. Nyika, A. Adediran, A., Olayanju, O. Adesina, and F., Edoziuno (2020) "The potential of biomass in Africa and the debate on its carbon neutrality" available at <https://www.intechopen.com/online-first/the-potential-of-biomass-in-africa-and-the-debate-on-its-carbon-neutrality> (accessed 9 July 2023).

<sup>26</sup> *Supra*, at 19.

<sup>27</sup> D. Abdullahi, & S. Suresh & S. Renukappa & D. Oloke (2017) "Key Barriers to the Implementation of Solar Energy in Nigeria: A Critical Analysis" IOP Conference Series: Earth and Environmental Science. 83. 012015. 10.1088/1755-1315/83/1/012015.

### **3.0. THE ROLE OF THE GOVERNMENT IN UNLOCKING PRIVATE INVESTMENTS IN RENEWABLE ENERGY**

Having identified the insufficiency of renewable energy investment programs which is a challenge impeding Nigeria's renewable energy system, the strategies that would lead to the availability of investments for the management and development of renewable energy in Nigeria will therefore be explored. Hence, this section aims to address the role of the Government in opening up private investments in renewable energy.

The business sector is prepared to make significant investments to advance, develop, and broaden the use of renewable energy.<sup>28</sup> Yet, most investors, especially in the private sector, are discouraged by the risks associated with investing in renewable energy. As the growth of renewable energy is presumably financed mainly by the private sector, governments must collaborate with the private sector to eliminate barriers and incentivise investments in renewable energy. The Government of Nigeria could play an essential role in increasing renewable energy capacity by developing regulatory frameworks and policy solutions to the setbacks impeding investments from the private sector. The Government should also institute renewable energy goals, policies, and market instruments to incentivise and de-risk green energy investments. Planning and permits should be encouraged, community concerns should be addressed while other issues are managed, and investments in contemporary infrastructure and electrical networks should be made.<sup>29</sup> However, the risks that presently accompany private investments in Nigeria's renewable energy will be discussed to shed light on the areas that need the Government's attention.

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<sup>28</sup> 'Shareholders Are Getting Serious about Sustainability' (*Harvard Business Review*, 24 November 2020) <https://hbr.org/2019/05/the-investor-revolution> (accessed 20 August 2023).

<sup>29</sup> N. Hutchinson, M. Dennis, E. Grann, T. Clevenger, M. Manion, J. Bøggild and J. Layke, "Unlocking a Renewable Energy Future: How Government Action Can Drive Private Investment", (2021) *World Resources Institute*, available at <https://www.wri.org/research/unlocking-renewable-energy-future-how-government-action-can-drive-private-investment> (accessed 25 July 2022).

### 3.1. Financial Risk

The absence of the needed infrastructure and inadequate infrastructure have scaled the average initial capital costs for clean energy investments in Nigeria.<sup>30</sup> The problem worsens with the higher prices of equipment installation in the short run for renewable projects, juxtaposed with non-renewables. This problem is more pronounced in Nigeria, where investors must depend on imported components due to internal capacity unavailability. These additional costs can be demanding for companies investing in a developing country like Nigeria. Although renewables are shown to be economical in the long run, with lesser operational and maintenance costs, many are unwilling to provide initial investments.<sup>31</sup>

Local and international banks are also reluctant to take the risk in Nigeria, so securing guarantees poses a great difficulty. This reluctance may be associated with Nigeria's poor reputation. Nigerian banks usually fail to issue sufficient long-term debt financing as financing for energy projects beyond five to seven years is scarce.<sup>32</sup> In addition, many investors, having borrowed money to finance their investments, end up in a position where extending their loans and obtaining additional financing becomes burdensome. Furthermore, most investors believe that the Nigerian Government lacks an understanding of areas that need power, hindering proper allocation of power. Looking at this, investors would face heightened risks on the occasion of a change in Government. Lastly, the instability of the prices of commodities sourced from the Nigerian market has also discouraged green projects, compounding the financial risk involved.

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<sup>30</sup> E. Norbert, "On the Path to Sustainability: Key Issues on Nigeria's Sustainable Energy Development", (2016) 2 *Elsevier Energy Report* 28-34.

<sup>31</sup> C. Sakoma and T. Blanchard, "Mobilising Private Capital for Green Energy Investments in Nigeria", ORF Special Report, July 2018, available at <https://emsdialogues.org/wp-content/uploads/2018/12/SR-Nigeria.pdf> (accessed 25 July 2022).

<sup>32</sup> A. Isah and others, "Financing Renewable Energy: Policy Insights from Brazil and Nigeria" (2023) 13 *Energy, Sustainability and Society*

The role of the Government concerning the above-stated problems is to develop favourable policies in addition to legal frameworks that will draw both foreign and domestic investors and also set standards to guide operations in the energy industry. Regulators must employ consistency and fairness; signed contracts should be respected; mobile courts are required to crush power theft, and key sector stakeholders must cooperate productively.<sup>33</sup>

### **3.2. Information Risk**

The inadequacy of knowledge regarding renewable energy in Nigeria is a matter that affects the interests of investors as there is a general technical inadequacy in the industry. Informational issues persist as the government lacks comprehensive datasets. This informative issue has increased investors' uncertainties when assessing the quality and value of existing assets. The argument is sparked by the necessary investment that must be made in the assets to ensure they live up to their claimed quality; neither party intends to invest a significant amount of money to improve the assets. An absence of knowledge in the economy about such things hinders investment, as the upkeep and management of renewable technologies, for instance, depends on a few individuals with the required skills. This lack of information and skill does not therefore encourage large projects or a series of investments.

Furthermore, the long-term economic and environmental benefits to local communities strongly motivate developing renewable energy enterprises. However, a lack of awareness of such technologies and their gains may cause ineffective uptake of new technology, mainly when renewable energy initially costs more than fossil-fuel energy. Without local support and maintenance, a renewable energy project

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<sup>33</sup> C. Sakoma and T. Blanchard, "Mobilising Private Capital for Green Energy Investments in Nigeria", *ORF Special Report*, July 2018, available at <https://emdialogues.org/wp-content/uploads/2018/12/SR-Nigeria.pdf> (accessed 25 July 2022).

is unviable. Thus, this information gap can work against investments.<sup>34</sup>

To make investments available in this sector, investors need adequate information before making an informed business decision to invest in the country. The unavailability of awareness about environment-friendly projects is a problem. Socio-cultural beliefs and practices may not encourage investments in climate action projects too. An instance of such belief and practice is the reluctance of some indigenous societies to sell land required for some renewable energy projects (eg. Solar farm). Such societies would rather engage in economic activities like farming, because they believe in continuing with their ancestor's preoccupation of farming. The sector is significantly under-reported and underestimated, which is a challenge to any investor. To deal with the need for adequate information, the Government, as the regulator, should carry out detailed research to point out environmental issues. Better media visibility on climate action projects, focusing on high returns on investment and a more substantial influence on health and ecological benefits, are also required. Private-public partnership for circulating information on renewable energy, particularly its advantages and opportunity, is necessary to promote public awareness.

### 3.3. Fraud Risk

Consumers' fraudulent acts also contribute to the lack of adequate investment in this sector due to its negative impact on revenue collection. Direct hooking is the most popular means of electricity theft wherein a consumer connects to power without the distribution company's authorisation<sup>35</sup>. This means of theft happens via tapping into underground cables, usually ahead of an energy metre, so the electricity used without consent cannot be easily weighed or turned off. This means it can also be called metre bypass. The term also refers to direct interference by shorting the wire in

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<sup>34</sup> *Ibid.*

<sup>35</sup> K. Nkemneme, "Impact of Electricity Theft on the Nigerian Electricity Industry" (2020) Power Library Hub available at <https://www.nigeriaelectricityhub.com/2020/10/02/impact-of-electricity-theft-on-the-nigerian-electricity-industry/> (accessed August 4, 2023).

the metre. A more advanced technical ability is to insert a transistor or resistor into the metre, resulting in a decreased measurement of electricity use that can be difficult to detect.<sup>36</sup> Also, consumers can create holes in an electro-mechanical metre to affect the metre's operations, and dishonest electricity officials can fix customers' bills or permit inappropriate connections to the grid for bribes. These tactics produce losses for electricity providers while presenting issues for their distribution systems. These matters hinder investors and entrepreneurs from embarking on investments in energy generation, renewable or otherwise, as they cannot adequately make business plans without certainty about their income stream.<sup>37</sup>

To assure investors, the Government is required to fix the liquidity issues in the power distribution sector and make existing contracts work. Investors should be confident that if they invest their money, generate power, and sell at a reasonable cost, they will earn back their capital and make profits. This confidence will also have a multiplier impact in decreasing demands for securities and guarantees. In 2018, the Federal Executive Council authorised the Central Bank of Nigeria (CBN) to approve a fund of ₦701 billion to be spent for two years. The fund was to ensure that the Nigerian Bulk Electricity Trading (NBET) pays at least 80 percent of issued invoices each month. This funding strategy is appropriate since every investor would like enough development toward a fair market. Debts will always exist, but the wisdom is that they do not tamper with people's capital investments. Without these assurances, no degree of persuasion will convince investors to invest.<sup>38</sup>

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<sup>36</sup> D. Patel, J. Dhameliya, B. Modi, P. Prajapati, "Theft Energy Detection with GSM3000", (2014) 2(2) *International Journal for Scientific Research & Development*, 816, 817.

<sup>37</sup> D. Dike, U. Obiora, E. Nwokorie, B. Dike, "Minimising Household Electricity Theft in Nigeria Using GSM Based Prepaid Meter", (2015) 4(1) *American Journal of Engineering Research* pp 59-69.

<sup>38</sup> C. Sakoma and T. Blanchard, "Mobilising Private Capital for Green Energy Investments in Nigeria", *ORF Special Report*, July 2018, available at <https://emsdialogues.org/wp-content/uploads/2018/12/SR-Nigeria.pdf> (accessed 25 July 2022).

### 3.4. Policy Risk

An unambiguous policy framework of legal, regulatory, and fiscal instruments is necessary to achieve non negligible renewable energy growth and accommodate the needed private sector investment. The execution of policies at the federal, state and local government levels makes long-term political support important in realising renewable energy development. Energy policies, as stated beforehand have been formulated by the Government but their continuity and active implementation have been deficient.<sup>39</sup>

Furthermore, there are investor issues with government power purchase agreements (PPA) regarding the tariff and counterparty credit risk, the conditional lengths of the PPA, financing terms, and their ability to grow commercially.<sup>40</sup> The Government should make PPAs a long-term feature and pass adequate legislation supporting them to give renewable energy providers security and their financial investors' confidence to increase investments in renewable energy development in Nigeria.

### 4.0. CONCLUSION: THE WAY FORWARD

The way out of the various challenges facing renewable energy development in Nigeria is the Government's realisation of the need for private investments accompanied with careful implementation of the strategies mapped out to unlock such investments.

It is impossible to overstate the importance of renewable energy in environmental protection. Several studies have indicated that renewable energy can contribute to energy generation and environmental protection. Nonetheless, the desired environmental protection will not be realised until specific obstacles and problems are overcome. One important impediment is the amount of money

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<sup>39</sup> N. Emodi and N. Ebele, *Policies Enhancing Renewable Energy Development and Implications for Nigeria*, (Science and Education Publishing: Sustainable Energy: 2016) 4(1), 7-16.

<sup>40</sup> I. Idemudia and D. Nordstrom, *Nigerian Power Sector: Opportunities and Challenges for Investment in 2016*, (Latham & Watkins Africa Practice, 23 February 2016, | Number 1930).

invested in renewable energy since it is impossible for the Government to complete the entire deployment of renewable energy. Indeed, the Government has created the Renewable Energy Master Plan to provide a broad vision, goals, and strategies for addressing the country's core energy concerns through rapid expansion and the utilisation of renewable energy.

Despite the Government's commendable efforts, challenges such as the lack of applicable laws, Nigeria's unreliable technical capability, the issue of public awareness and acceptance, and economic and financial barriers can slow down the enormous benefits of using renewable energy.

In light of this, the author views private investment to be a critical deciding factor in accomplishing the goals of sustainable renewable energy. Nonetheless, the engagement of private investors is intended to supplement the Government's efforts rather than completely replace them. This is why the Government must take the appropriate steps to encourage private investment in renewable energy. Thus, it has been made clear how crucial the Government is in lowering risks that may otherwise deter private investment. In light of this, the Government's effectiveness in promoting and releasing private investment is essential.