Overcoming the Challenges of Financing Utility Scale Renewable Energy Projects in Nigeria

By Ado Ahmed

RENEWABLE ENERGY POTENTIAL IN NIGERIA

Renewable energy (RE) resources hold great potential for meeting the energy needs of Nigeria, a country that is aptly described as an energy deficient nation. With abundant RE resources such as biomass, strong winds, unlimited solar potentials, hydro and geothermal resources, Nigeria has sufficient RE resources that could potentially provide a significant proportion of the country's expanding energy needs.

For example, the country has a solar radiation of between 3.5 kWh/m²/day at the coastal areas and 9.0 kWh/m²/day at the northern boundary. This presents a great opportunity for Nigeria to get RE at low cost as well as minimize her dependence on fossil fuels (Oji et al, 2012). In terms of wind resources, the country has an annual average of 2-4m/s at 10m height mainland which has significant potential to contribute to electricity production (Bala, 2014) The country also has sufficient endowment of other RE resources such as hydro resources (a potential for 14,750 MW electricity generation), biomass resources (which run into millions of tons) and geothermal resources among others.

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ENERGY SHORTAGE IN NIGERIA

Despite the country's rich endowment in hydro carbon resources and its heavy reliance on them, energy supply in Nigeria (especially electricity and refined petroleum) has been inadequate and unreliable. This has turned Nigeria into an energy deficient nation compelling widespread dependence on diesel based generators by different classes of electricity consumers. Currently only 40% of urban and 10% of rural residents have access to electricity. Per capita consumption of energy at about 212 kWh (FGN, 2014) is one of the lowest in the world. The consequences of this on business competitiveness and the social lives of the people are enormous. Deficient supply of modern fuels has also compelled a heavy reliance of households on biomass resources such as fuel wood, corn stocks, animal dung, among others, for domestic energy use despite their inefficiencies and health risks. Modern fuel scarcity in the economy and failing electricity supply create a dual energy crisis for Nigeria (Iwayemi, 2008). Studies report that small scale businesses suffer the most from Nigeria's energy poverty. They spend a large proportion of their capital (about 20-25% of their investment) on back-up generating facilities (Lee and Anas, 1991; Foster and Steinbuck, 2008) thus turning the Nigerian economy into a generator economy (Ekpo, 2009)

The economic cost of inadequate and unreliable electricity to the Nigerian economy is huge.

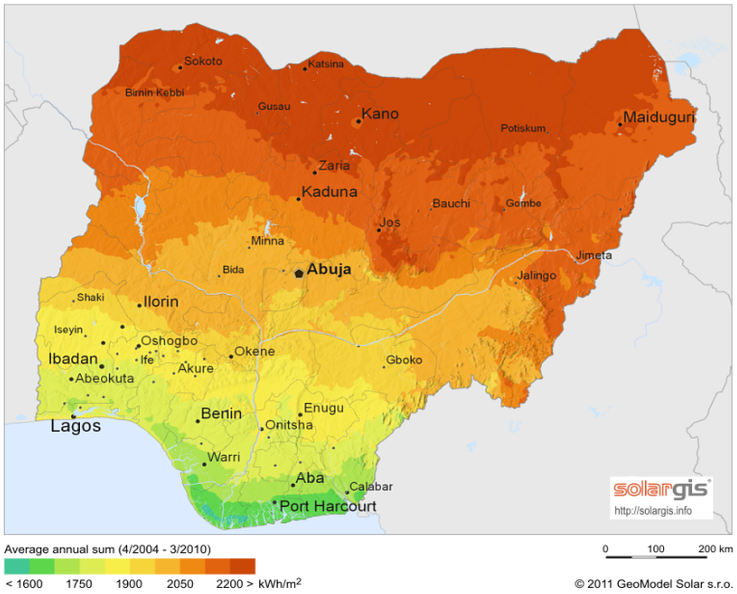

Figure 1: Global Horizontal Solar Irradiation for Nigeria
Source: Sambo, (2011)

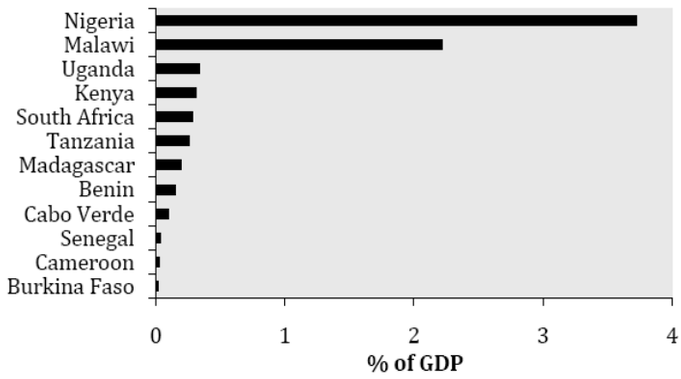

Figure 2: Economic Costs of Power Outages in Selected Countries
Source: Eberhard, et al (2009) reported in Foster and Pushak, (2011)

They cost the Nigerian economy close to 4% of the country's GDP.

Nigeria's energy supply can be altered with the use of RE resources which the country is well endowed with. This could potentially change its current economic status and thus release its growth potentials.

INCREASING ENERGY SUPPLY WITHOUT HURTING THE ENVIRONMENT

Renewable energy investment has today occupied a centre stage in terms of policy and academic research. For example, RE investment rose from about 22 billion dollars in 2002 to about 270 billion dollars in 2014. The share of RE investment for developing countries also rose to 138 billion dollars (UNEP-Bloomberg, 2015). This growth is expected to continue into the future as more countries strive to increase the share RE in their energy mix.

Developing the RE resources of the country will be of immense benefit to the nation in terms of ensuring the security of its energy supply and enhancing the wellbeing of the nation's environment. Consequently the Nigerian government churns out deliberate policies for developing the country's RE resources for electricity supply. Some of these policies include the Light up Rural Nigeria, Feed-in Tariffs, the National Renewable Energy and Energy Efficiency Policy among others. However, developing the huge RE potentials of Nigeria is a daunting task for many reasons.

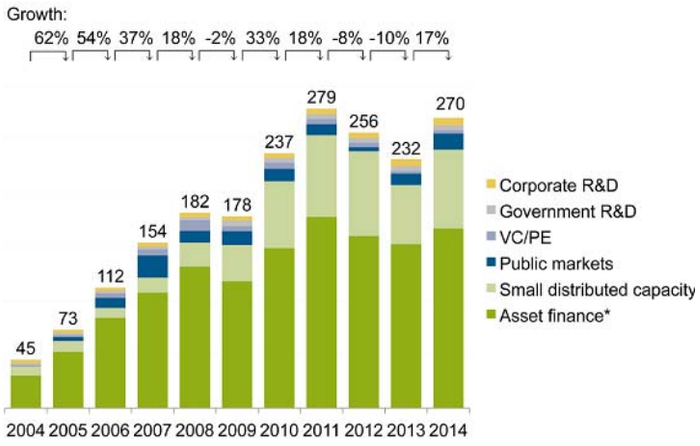

Figure 3: Growth in Global RE Investment2004-2014
Source: UNEP-Bloomberg New Energy Finance, (2015)

IMPEDIMENTS TO FINANCING UTILITY SCALE RENEWABLE ENERGY PROJECTS IN NIGERIA

Though the private sector seems to be interested in the Nigerian energy sector especially the RE subsector, there are several of challenges that slow down the pace of private investment in Nigeria's electricity sector. One of the greatest challenges facing promoters of RE projects in Nigeria is the difficulty of mobilizing the needed investible funds for such projects from the financial markets. Studies have shown the positive impact that financial sector development has on renewable energy production (Brunnschweiler, 2006). The success of private sector investment in renewable energy projects will depend on the robustness of the financial services market and its ability to provide the needed investible funds in RE projects (Babber and Schuster, 1998).

Like most infrastructure projects, renewable energy projects normally require enormous financial resources and long construction and pay back periods. Meeting the financing needs of such projects in a country with an undeveloped financial market is really a daunting challenge. Though such projects have low operational costs, the time they normally take to repay their investments usually make them unattractive to investors.

Another important barrier to renewable energy financing has to with the cost disadvantage that renewable energy projects suffer in relation to conventional energy projects. This arises due to the failure by stakeholders to account for the implicit costs such as social and environmental costs associated with conventional energy projects (WEC, 1998; Handerson, 2007; Brown et, al, 2012). This failure reduces the competitiveness of RE projects in the eyes of investors and other stakeholders. Closely related to the above is that RE projects are relatively new in Nigeria. Stakeholders lack requisite experience in funding or promoting private sector utility scale renewable projects. Though there are few utility scale private sector RE projects such as the 2,600 MW hydro plant in Mambilla (Mambilla project is still at the engineering drawing stage), the 700 MW hydro plants in Zungeru, the 300 MW expansion of the hydro plant in Gurara , Dadin Kowa 34MW hydro project and a few others, none of such projects have become operational despite government support for such projects. The lack of experience and familiarity with RE projects among stakeholders especially policy makers, financiers and bankers add to the difficulties that RE projects suffer in Nigeria, as occurs in many developing countries in raising funds for RE investment.

Other issues that makes it difficult for RE investors to raise funds from the local capital market has to do with the absence of venture capital firms, the very low debt profile of the market, instability re-

sulting from internal conflicts and insurgent activities with Boko Haram insurgency in the North East of the country and the uprising in the Delta region (Pegels, 2009; UN-Energy/ Africa, 2011) The massive devaluation of the Naira poses serious currency risks to promoters of RE projects. This happens due to many reasons. First, with the devaluation of the Naira the cost of imports of the machinery and spare parts has increased astronomically. Tariffs may not readily adjust. The country's multiyear tariff order (MYTO) allows only a gradual increase in tariff. Additionally borrowing or raising funds from abroad will put the project at risk.

The attractiveness of RE projects may be less because the viability of such projects may be affected by the willingness to pay for electricity from RE sources by consumers of electricity in Nigeria. Given the prevailing economic difficulties being experienced in the country due to low commodity prices especially oil (many workers are unable to get their salaries on time and the minimum wage is less than 60 dollars), one may not hastily conclude that consumers would be willing to pay a premium for green electricity. Raising finance for RE projects will therefore be challenging due to issues associated with willingness to pay by consumers.

Financing RE projects in Nigeria is also hindered by weak regulatory and institutional arrangements just like many other developing countries (Brunschweiller; 2006; Brown et al 2012 ;Estache 2005) . These breed unfavorable regulatory and political climates which translate into a lack of sufficient supportive investment policy regimes. The absence of a credible and consistent policy regime for RE investments is a major barrier to RE project investment in most developing countries, Nigeria included.

Technical constraints in the industry also hinder RE projects financing. Most developing countries have a major infrastructure shortage that potentially negatively impacts energy projects. Poor or inadequate transmission and distribution infrastructure in most developing countries hinder additional generation capacity that could materialize through new RE projects. For example, Nigeria's transmission and distribution infrastructure cannot wheel and distribute power beyond 5000MW. Thus new investment that can result from RE projects may not be readily transmitted and distributed to the consumers. There is also a general lack of human capital sufficiently skilled on RE projects. In fact, sufficient knowledge and capacity on RE projects is lacking among the project stakeholders in many developing countries including Nigeria (WEC, 2012).

OVERCOMING THE IMPEDIMENTS TO FINANCING RENEWABLE ENERGY PROJECTS

To fast track investment in Nigeria's RE, government needs to intensify efforts towards creating a robust and functional financial services sector that could channel investible funds to RE projects. This is not going be an easy task. There was a policy to address that. The Financial Services Strategy (FSS 2020) was meant to reposition the financial services sector of the country to meet the financing needs of infrastructure projects. However due to lack of policy continuity by government, the FSS 2020 policy has been abandoned. A functional financial market will assist in mobilizing finance for RE projects.

There is need to encourage venture capital investment in Nigeria as a way of easing the process of raising funds for investors in RE projects. Improving the legal and regulatory environment could help in this regard.

The current economic recession being experienced in Nigeria means that the government's ability to provide fiscal incentives for RE projects is constrained. However, government needs to come in with fiscal supports to RE projects in order to enhance the attractiveness of green energy projects since they suffer a cost disadvantage compared with conventional energy projects. This could help to bring such projects up to par with conventional energy projects whose costs are not normally sufficiently accounted for in terms of their social and environmental impacts.

Though the government has developed some policies meant to support investment in RE projects, the current policies are not sufficiently implemented, thus leaving RE investors without the needed supportive policies. Thus strengthening the implementation process of such supportive policies could go a long way to give the needed boost for RE investment in Nigeria.

Infrastructure investment hardly happens in climes with weak institutions. Nigeria needs to strengthen its institutions especially legal and regulatory institutions in order to give sufficient confidence to the investing public to invest in Nigeria's RE. Normally investment in infrastructure projects require complex contractual agreements that in turn require strong institutions to implement.

There are a lot of technical constraints in the Nigeria electricity supply industry. Manpower shortage is evident and needs to be reversed especially in areas related to RE investment and project management. Other technical constraints have to with the archaic and inadequate transmission and distribution

facilities in the country. Massive investment is required to develop and upgrade these infrastructures. However government does not have the financial resources to do this. The private sector may need to be incentivized to be able to make investment at least in the distribution segment of the industry.

Overcoming the constraints to financing RE projects will go a long way in enhancing electricity supply in Nigeria, in de-carbonizing the electricity sector of Nigeria, in creating employment opportunities for the many youth that are currently unemployed.

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