Energy-Climate Dilemma in Nigeria: Options for the Future

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BACKGROUND

The importance of energy in the wellbeing of any society cannot be overemphasized as its scale of use determines the socio-economic development of any nation. Access to a sufficient supply of energy is a major challenge in most economies in the world today because it affects all facets of our lives. Nigeria is undoubtedly the most populous and largest economy in Africa, but about 70% of its population lives below the poverty line, while around 45% do not have access to electricity and 72% still depend on traditional solid biomass for cooking. The annual electricity access situations from 2005 – 2012 in Nigeria are shown in Figure 1.

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See footnotes at end of text.

Lack of access to energy contributes to inequality, poor health, education and poverty in all aspects. A study by the World Health Organization reported that around 95,000 Nigerians die annually from indoor air pollutants produced by the inefficient combustion of solid biomass for cooking (WHO, 2007). Additionally, it has been estimated that indoor air pollutants are the biggest cause of death in the country after malaria and AIDS. Furthermore, the time spent by people (mostly young girls and women) in collecting firewood from the forest can be used for other productive and income generation activities if they had access to modern forms of energy. Moreover, lack of access to electricity prevents many Nigerians from having access to communication, entertainment, news through audio-visual which in turn limits their abilities to access information. While mentioning the challenges faced by those having no access to modern forms of energy in Nigeria, unsustainable consumption of biomass leads to land and forest degradation which also has a negative impact on the climate.

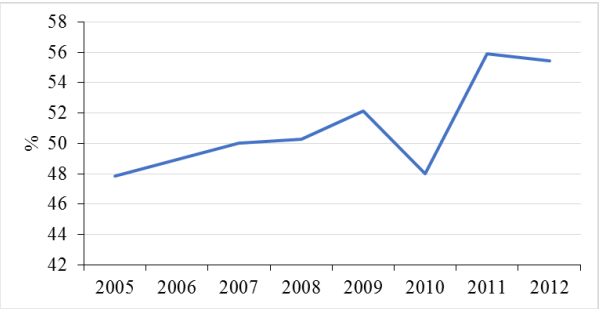

Figure 1: Percentage of population having access to electricity in Nigeria[1]

Given the importance of energy and the challenges faced by those who do not have access to its modern forms, the United Nations declared the 'Sustainable Energy for All' initiative in 2012 with the objective of ensuring universal access to clean, reliable, sustainable and affordable energy for all by 2030. Furthermore, owing to the importance of energy in our everyday life, the Sustainable Development Goals (SDGs) captured energy access as goal number 7. These global initiatives have prompted many governments to pay more attention to the energy sector.

However, over 80% of the world's energy today is supplied by fossil fuel (IEA, 2017). The combustion of fossil fuels for economic activities such as transportation and electricity generation releases greenhouse gases (GHG) which causes global warming and thus leads to climate change. The adverse effects of climate change are being experienced today and it may be seen in the melting of the ice caps as well as rising of the sea levels. In Nigeria, climate change impact has also been felt. For example, the drying up of Lake Chad from around 4000 sq.km to around 3000 sq.km between 1960 and 2007, respectively, may be attributed to the severe impact of climate change in that part of the country (FGN, 2015). Thus, climate change poses a great challenge to the socio-economic development of Nigeria. The total annual GHG emissions in Nigeria from 2005 – 2012 are shown in Figure 2.

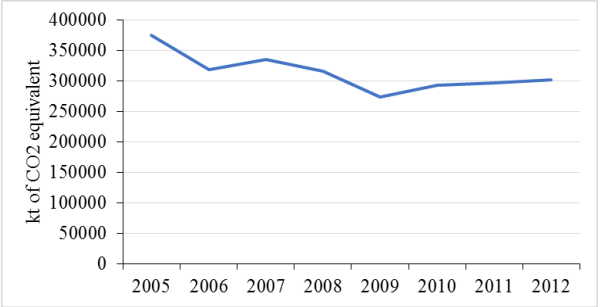

Figure 2: Total GHG emissions in Nigeria.[2]

In an effort to combat climate change, the United Nations Framework Convention on Climate Change (UNFCCC) Conference of Parties, COP-23 held at Paris in 2015 called on all countries across the globe to submit an Intended Nationally Determined Contributions (INDC) to limit GHG emissions. Nigeria is a signatory to the UNFCCC and has been participating seriously in the efforts to combat climate change. Despite contributing an insignificant share to the current climate problem, Nigeria has pledged to become part of the solutions in its INDC to cut down GHG emissions by 20%

below business-as-usual unconditionally and 45% conditionally by 2030.

The current energy supply system of Nigeria is dominated by fossil fuel (85% natural gas) (NPBR, 2015). This implies that for Nigeria to achieve the energy for all initiative as well as its INDC by 2030, its energy system needs to be transformed into a low carbon energy system. The transformation of the energy system from a fossil fuel dominated power supply to a low carbon society under a short time frame might present some challenges which create a dilemma for Nigeria. This dilemma raises questions on what can be done, what options are available to Nigerians, and how to finance an ambitious low carbon future. These questions can be answered through the following options presented in the following sections. Also, the options presented can aid Nigeria in achieving its energy for all initiatives and INDC by 2030.

OPTIONS FOR THE FUTURE

Distribution of mitigation efforts

Although the energy sector has been identified as the largest contributor to Nigeria national GHG inventory (FGN, 2014), efforts toward climate change mitigation should be distributed across all sectors of the economy. This action will go a long way to reduce the stress on the already fragile energy system which will, in turn, facilitate the development of a least-cost energy system that can satisfy unmet energy demand while mitigation efforts in other sectors can compensate for GHG emissions from the energy sector. The agriculture sector contributes around 28% of the total national GHG inventory (FGN, 2014). Hence, efforts towards mitigation may be directed in this sector. Sustainable agricultural practices such as reforestation, low tillage, growing of cover crops and integrated livestock-crop agriculture need to be encouraged in the country. Additionally, there is the need to encourage sustainable lifestyle among the citizens. Nigerians should be encouraged to use public modes of transport as well reduce the consumption of meat as these efforts alone will help to reduce individual carbon footprints and in general, the national GHG inventory. For it is when efforts are distributed across different sectors of the economy and among the citizens can the goal of low carbon development be achieved. Moreover, this will aid in the reduction of carbon constraints of the already existing energy system which will further help in increasing the supplying of energy to all in Nigeria. Still, on efforts distribution, it is worthwhile to note that Nigeria is still a developing country with over half of its population living below the poverty line. Hence, international assistance in the form of technology transfer and capacity building are still required.

Exploiting renewable energies in the country and energy efficiency practice

The energy sector is no doubt the biggest source of GHG emissions in the world as well as in Nigeria. Thus, for Nigeria to achieve its socio-economic development goals while maintaining a low carbon economy, a radical change is needed in the energy system of the country. The role of renewable energy in limiting GHG emissions cannot be ignored. For Nigeria to provide energy for its entire population while limiting GHG emissions, all forms of renewable energies needs to be exploited. Nigeria is blessed abundantly with nearly all forms of renewable energy. Solar energy is the most available renewable energy in the country. Nigeria receives average solar irradiation of 3.5 – 7 kWh/m2 as you move from the southern part of the country to the northern part (Akorede et al., 2017). The country also has large biomass energy resources estimated around 13 million hectares of wood, 61 million tonnes of animal waste annually, and 83 million tonnes of crop residues (Agba et al., 2010). Furthermore, the country also has some margin of wind energy with wind velocity of 3.0 – 3.5 and 4.0 – 7.5 m/s at 10 m height in the southern and northern regions respectively (Dioha et al., 2016). The potential of other renewables such as geothermal and ocean thermal are not yet quantified in the country. However, Nigeria has the option of combining the already mature renewable energy technologies in the country to provide energy for its citizens which will, in turn, decouple adequate energy supply from GHG emissions in the country. For instance, rooftop solar PV technology and solar water heaters can be employed in the residential sector of the country. The residential sector accounts for over 50% of the total energy consumption in the country. This scale of effort alone will go a long way towards reducing electricity demand from the fossil fuel based supply system. Emodi and Yusuf (2015) had earlier opined that the Nigerian government needs to pay serious attention to the deployment of renewable energy technologies in the country if anything near electricity for all in the country is to be achieved in the near future.

While acknowledging the role of renewable energy in low carbon transition, it is also worthwhile to highlight the role of energy efficiency and energy conservation. Energy efficiency practices and energy conservation will go a long way to reduce the demand for energy in the country, which will in turn help in providing energy for those who do not have access to it as well as reducing the combustion of fossil

fuel for electricity generation which releases GHGs. With respect to this option, emphasis needs to be laid on demand-side management techniques as well as phasing out of inefficient appliances in the country such as incandescent bulbs in the residential/commercial sectors and sub-critical boilers in the industry sector of the country.

Robust financing mechanisms and fiscal incentives

Financial investment and fiscal incentives are required in the low carbon transition agenda. Thus, there is need to develop innovative financing schemes that will reduce the cost of low carbon technologies for consumers as well as being a profitable project for investors. At a national level, there is the strong need for mobilization of funds both within and outside the country. From within, the federal government of Nigeria needs to apportion a reasonable proportion of the national budget to the energy sector given the importance of this sector in the wellbeing of the country. Taxes and levies should be laid on industries that produce a significant amount of GHG emissions during operation and a low carbon development fund should be established. Since Nigeria is a mixed type of economy, the private sector also has a role to play in the mobilization of funds internally. The government should open up the energy sector in ways that will get the private institutions such as the commercial banks to start providing funds for clean energy development projects. When strong efforts have been made internally, then Nigeria can have a good case when seeking international funds from bilateral agencies and donors to augment whatsoever has been made internally.

To keep the sustainable development agenda on the right track in Nigeria, government needs to incentivize private investors through guarantee schemes, provision of equity in investments, removal of import duties on clean energy technologies, subsidies, and grants as these policies and schemes will go a long way to reduce the bottlenecks that the private sectors would have faced while investing in clean energy technologies. Moreover, these incentives will go a long way to reduce the price of low carbon technologies in the country and thus, the poor can afford them which will, in turn, accelerate the transition to modern energy while limiting GHG emissions.

Education and awareness for sustainable development

Despite global efforts in response to climate change, it may be noted that many Nigerians (especially those living in the remote villages) are not informed about the scale of this problem and its future implications. Knowledge is described as power; it empowers civil societies, communities, and individuals to get involved in government actions and agenda while making their choices in life. Thus, there is a need to scale up efforts in reaching out to those in the remote areas with information about sustainability. This can be done through incorporating the teaching of sustainable development in the education curriculum starting from primary school. Television, radio stations and other forms of media also have a role to play towards achieving this objective. They can provide information for those who have access to these appliances. Information will enable the citizens to know the low-carbon choices available to them and how best they can fall into this sustainable lifestyle campaign. Additionally, emphasis needs to be paid to cultural and religious beliefs. Many Nigerians rely on what their clerics teach without paying adequate attention to scientific evidence. Thus, education needs to begin with the community and religious leaders because it is only when they are properly informed about the current issues facing the society, can they be willing in full capacity to convince their subjects and members of their faith communities. Adopting this option will help to lower other factors that may contribute to GHG emissions and thus expand the carbon space for Nigeria.

Monitoring and evaluation of low carbon development projects

The menace of corruption cannot be ignored in any discourse of socio-economic development of Nigeria. The present energy situation in the country may be partly traced to the severe corruption in the power sector. As Nigeria journeys in the lane of low carbon development, clean energy projects will be developed which will require huge financial investments. For Nigeria to ensure that these finances are used for the appropriate purposes, projects need to be monitored from the conceptual stage to the commissioning stage. In between, frequent evaluations need to be made to ensure that things are working according to plan as well as identifying potential risks for success. To ensure more transparency, experts from donor organizations may also be involved in the evaluation meetings. Additionally, for effective planning and decision making, there is the need for communal participation at all levels in the development of projects. Their presence and inputs will help to guide investments in the appropriate technologies while ensuring fairness and transparency during the entire projects.

CONCLUSIONS

Nigeria has the highest number of persons living without access to electricity and clean-combustible cooking fuels in Africa. It has also been called upon to reduce its GHG emissions in support of global efforts towards combating climate change. For Nigeria to achieve anything near this twin objective of satisfying unmet energy demand as well as limiting GHG emissions, innovative policies and financing mechanisms are needed. Greater emphasis needs to be paid on creating awareness of the severe impacts of climate change while drawing on the full potentials of low carbon energy sources in the country. If eyes are taken away from these options, the double objective of energy access and climate mitigation by 2030 will only remain an illusion for Nigeria.

Footnotes

[1] Source: (World Bank, Sustainable Energy for All (SE4ALL) database from the SE4ALL Global Tracking Framework led jointly by the World Bank, International Energy Agency, and the Energy Sector Management Assistance Program)

[2] Source: European Commission, Joint Research Centre (JRC)/Netherlands Environmental Assessment Agency (PBL). Emission Database for Global Atmospheric Research (EDGAR), EDGARv4.2 FT2012: edgar.jrc.ec.europa.eu.

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