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The Need For Energy Efficiency In Nigeria: Taking The Footstep Of Niger Republic

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Abstract

Worldwide, nations are beginning to face up to the challenge of sustainable energy by re-evaluating the way energy is generated and utilised so that social, environmental and economic aims of sustainable development are supported. Nigeria as a developing nation has a growing need for the generation of huge amounts of energy to fuel development. This intensive energy need, largely relies on our fossil fuels for generation reserves. At first sight there would appear to be an apparent paradox between using energy efficiently, minimizing pollution and developing a healthy and prosperous nation. However, in recent years energy efficiency has significantly gained in stature and has become recognised as one of the most cost effective ways of meeting the demands of sustainable development. The benefits of energy efficiency upon the environment are self-evident and the economic benefits of improving energy efficiency have been well documented since the first Oil Crisis in the early 1970's. Many forward-thinking industrial and commercial concerns have already adopted energy efficiency as a key policy towards maximising profits. Niger Republic which relies partly on Nigeria for its energy supply (from electricity) were able to achieve some level of high energy conservation and efficiency. This paper would examine the policies and strategies adopted in Niger Republic and at the end recommend some measures to be adopted in Nigeria since energy efficiency is fast gaining ground as a cost-effective means to approach all aspects of sustainability.

Keyword: Energy, Efficiency, Sustainable energy, Nigeria, Niger, Electricity.

1.0 Introduction

Energy efficiency is a fundamental element for progress towards a sustainable energy future. As global energy demand continues to grow to meet the needs and aspirations of people across the globe, actions to increase energy efficiency will be essential. Energy is an essential ingredient for socio-economic development and economic growth. The objective of the energy system is to provide energy services. Energy services are the desired and useful products, processes or indeed services that result from the use of energy, such as for lighting, provision of air-conditioned indoor climate, refrigerated storage, transportation, appropriate temperatures for cooking etc. The energy chain to deliver these cited services begins with the collection or extraction of primary energy, which is then converted into energy carriers suitable for various end-uses. These energy carriers are used in energy end-use technologies to provide the desired energy services (Sambo, 1997).

From the foregoing, it is clear that energy is an essential input to all aspects of modern life. It is indeed the life wire of industrial production, the fuel for transportation as well as for the generation of electricity in conventional thermal power plants.

Energy governance refers to the efficient management of energy resources to achieve security of supplies, access to services and environmental sustainability. All aspects of the energy sector in Nigeria are in one crisis or the other. For instance electricity reaches just over one third of the population and is currently available less than eight hours per day. The links between poverty reduction and energy efficiency services, particularly electric power in Nigeria is that, major energy service contributes to income and non-income poverty reduction through various channels. At the national level, it serves as an input to industry, transport and communications, and cross-border power trading. At local levels, it facilitates economic development by supporting agriculture and through nonfarm economic activities. At community level, electricity improves health and education services, and at the household level it provides basic lighting which

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facilitates cooking, reading, household level economic activities, among others. Electricity can also reduce or avoid household level pollution due to the use of coal, wood fuels, etc., and improving public health outcomes, particularly of women, children and elderly people. There is evaluation evidence which demonstrates that access to electricity improves the lives of the poor people.

2.0 Energy Policy Implementation

Although the issue of energy efficiency has been discussed in almost all the countries, the extent of actual initiation and implementation of energy efficiency activities varies widely from country to country. No policy can succeed without proper implementation. To achieve the stated energy policy objectives and successfully implement the strategies, various instruments including economic measures, information and education, legislative measures and institutional arrangements need to be used. Some problems have to be effectively addressed for the successful implementation of the following Energy Policy.

i. All Government energy related policies will derive from, and be consistent with, the overall National Energy Policy.

ii. The Energy Commission shall be the focal point for the monitoring and coordination of the implementation of the national energy policy.

3.0 Electricity Production, Consumption, Exports, Imports Status And Management In Nigeria And Niger Republic

Nigeria as the most populous nation in the African Continent [over 146 million people in 2008 (CIA, 2008)], ranked 10th in the world population and 6th in Africa's gross electricity generation in 2005 at a total production of 17.90TWH, averaged a poor 136kwh/capita (one of the lowest in the West African region that year). Niger republic had a population of 13,272,679 in July, 2008, ranked 66th in the world population (CIA, 2008). Nigeria has over the years embarked on one of the most ambitious rural electrification programmes on the continent with many rural communities either connected to the grid or with stand alone community power schemes. The problem however is that the poor availability of generating capacity results in poor reliability of supply and frequent blackouts.

Nigeria's installed capacity grew from 2,240MW in 1983 to a peak of 5,959MW in 1992 which dropped off to 5,898MW in 2005 (Olumuyiwa, 2008).

Nigeria, Ghana and Côte d'Ivoire are the largest generators of electricity in West Africa. The production, consumption, exports and import of electricity in Nigeria and Niger republic are shown in Table 1. Although the country exports electricity to neighboring Niger, poor availability results in frequent national blackouts. This leads to frequent power cuts, load shedding and at times outright grid collapses in the country (Nigeria).

4.0 Why Nigeria Is Behind In Electrical Energy Efficiency Production.

The present state of electrical energy production and use in Nigeria is caused by a number of factors. The most prominent of these factors are:

i. Poor Economic status.
ii. Unstable Government's policy.
iii. Ethnic conflicts.

In consequence of the foregoing, many Nigerians cannot afford appropriately priced electricity. Many power utilities in Nigeria are wholly government owned, financed and operated. Corruption content

Table1. Electricity production, consumption, exports and imports in Nigeria and Niger republic

Country	Electricity Production (kwh) in 2006	Electricity Consumption (kwh) in 2006	Electricity Exports (kwh) in 2007	Electricity Imports (kwh) in 2007
Nigeria	22,110,000,000	15,850,000,000	0	0
Niger Republic	240,000,000	443,200,000	0	225,000,000

Source: CIA, 2009

of public services in Nigeria became a crippling combination for electrical power development. In Nigeria where electricity is priced, most Nigerians whose economic ratings were on less than $1.00/ day could not afford it. These economic factors are the reasons why most electrical systems in Nigeria are quite obsolete, as they date from the colonial era.

In Nigeria, ethnic militancy in the Niger delta regions where most of the country's oil and gas exploitation takes place, has resulted in blowing up of gas & oil pipelines, disrupting the supplies to thermal fired power stations. The continuous instability occasioned by these conflicts has also been largely the reason why Nigeria has not attracted the necessary foreign and institutional investments required for electrical power development.

5.0 Electricity Utilization In Nigeria And Niger Republic

Electricity is a form of energy, which enjoys considerable and diverse applications because of its flexibility and ease of transmission and distribution. Availability of Electricity remains a major factor in the location of industries and a strong instrument of social development. Its supply is however still inadequate in Nigeria while Niger has adequate supply of it throughout the day, even when their source is from Nigeria. Access to electricity services is poor in Nigeria. About 60 percent of the population – approximately 85 million people are not served. Per capita consumption of electricity is approximately 100kWh in comparison to 4,500kWh, 1934 kWh and 1379 kWh in South Africa, Brazil and China, respectively (Ewah, 2007). The proportion of Nigerians without access to electricity services will continue to increase over time as the poor services of electricity increase.

The annual consumption of electricity has been increasing very rapidly over the last three decades both in Nigeria and Niger Republic. In Nigeria it increased from 1,273 GWh in 1970 to 13,700 GWh in 2001 (Luckman, 2003). This however represents a suppressed demand caused by inaccessibility to the national grid and inadequacies of the electricity supply. One consequence of this is that various industries and other consumers have installed generators whose total capacity is estimated to be at least 50% of installed capacity of the national grid.

Domestic sector has accounted for over 50% of the grid electricity consumed in both the two countries while the commercial and industrial sectors have accounted for about 25% each. In view of the ever-increasing demands for electricity in these countries, there is a need to attract investment funds to the sub-sector, increase substantially the available installed capacity and also decrease distribution losses particularly in Nigeria where a lot of electricity is lost in the transmission process. These justify the need of the following policies in Nigeria's electricity sector:

i. The nation shall make steady and reliable electric power available at all times, at economic rates, for economic, industrial, and social activities of the country.

ii. The nation shall continue to engage intensivel in the development of electric power with a view to making reliable electricity available to 75% of the population by the year 2020.

iii. The nation shall promote private sector participation in the electricity subsector and ensuring broad-based participation of Nigerians.

6.0 Inefficient Energy Utilization And Unreliability of Electric Energy Supply In Nigeria Compared To Niger Republic

Presently, energy utilization in Nigeria is far from being efficient. There is the direct loss due to energy wasted energy, which is added to the costs of goods produced from in dustries especially heavy industries that consumed high amount of energy like cement, steel mill industry. The potential way for energy savings is substantial in the two most energy consuming sectors of the economy namely household and industry. In the household sector, substantial savings can be made by simply switching over from incandescent bulbs to fluorescent lamps in Nigeria. This policy has been adopted in Niger Republic. Compact fluorescent lights use two-thirds less energy and may last 6 to 10 times longer than incandescent light bulbs. Hence, this helps the country (Niger) in conserving, and utilizing the electricity received from Nigeria. In the industrial sector especially in Nigeria where there are many

heavy industries, energy consumption can be saved by putting off electrical machinery on no-load condition, and avoiding material wastages. The major problem of electrical energy efficient practices in Nigeria is lack of awareness of the potential and importance of energy efficiency in the utilization of electricity.

Substantial electric energy is lost during transmission and distribution in the electric energy supply in Nigeria. These losses are sometimes more than 30% of the total electricity generated because of the poor transmission, distribution and utilization of the electricity in the country (Sambo, 1997). Apart from these inefficiencies, the reliability and availability of existing installed electric generation system is low. There is the serious problem of power unreliability in Nigeria compared to Niger Republic where they have stable electricity over the years. This causes huge economic losses to the Nigerian economy.

The major factors contributing to the above unreliability and inefficiency in the electricity supply in Nigeria are:

i. Frequent breakdown of generating plants and equipment due to inadequate repairs and maintenance;

ii. Lack of foreign exchange to purchase needed spare parts on time;

iii. Obsolete transmission and distribution equipment which frequently breakdown;

iv. Lack of skilled manpower;

v. Poor energy financing;

vi. Weak institutional framework.

7.0 Conclusion

To achieve a more rational and efficient energy utilization in Nigeria, we must ensure that wastages in energy use are reduced especially in transmission and distribution of electricity, energy efficiencies of major energy supply systems are to be improved considerably and a more energy efficient development path is to be pursued. The following recommendations are made to ensure improved electric energy efficiency in Nigeria:

i. Encouraging households to shift to more energy efficient items such as using fluorescent bulbs instead of incandescent bulbs, and use digital household meter instead of manual meter.

ii. Creation of awareness for the benefits of energy savings in all sectors of the economy and reward the best and most compliant consumers.

iii. Providing incentives for energy intensive industries to invest in industrial energy efficiency measures and human resources development in the area of energy conservation.

iv. There is urgent need for more support of research, development, demonstration and discussion activities in the existing research centres such as Renewable Energy Research Unit (RERU) Umaru Musa Yar'adua University Katsina, as well as Intensified research, development and training in alternative sources of energy, such as Solar Photovoltaic (PV) for the generation of electricity in Nigeria.

v. There is the need to identify organizations or offices at states and local government levels that will be charged with the responsibilities of ensuring the full implementation of projects and programmes of the Energy Commission of Nigeria at the grassroots levels.

vi. Expansion of the existing electricity transmission and distribution networks.

vii. Development of appropriate infrastructure, guidelines, laws and regulations for the management of a liberalized and privatized electricity sub-sector.

viii. Commercialization of electric utility agencies and granting them managerial and financial autonomy to enable them operate efficiently.

ix. Establishing a reduced tariff regime for very low and especially handicapped electricity consumers and a mechanism for funding the subsidy.

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