

## Review

# Renewable energy and prospects in Nigeria

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Renewable energy is no doubt the way out for Nigeria, looking at her dwindling oil reserve and the consequent green house effect of the burning of fossil fuels within her territory. Nigeria is currently experiencing a tough time in its energy sector. Presently, incessant power supply is the order of the day. The power Holding Company of Nigeria cannot guarantee a full-day uninterrupted power supply to Nigerians, reasons being that the present conventional energy sources are operating below their installed capacity. In this review work we have investigated the available renewable energy resource in Nigeria, the amount available and the possible use of such renewable sources in Nigeria. This research work is aimed at promoting the adoption of renewable sources of energy in Nigeria. From the review, it was observed that Nigeria is blessed with so many renewable energy sources, such as wind, solar, hydro, bio and agro. Today Shell petroleum is embarking on agro-related renewable energy sources. Such agro-related renewable sources include: ethanol, cassava, etc. These sources are called renewable since they can be regenerated naturally. It was recommended that our government should encourage more researches in the area of renewable energy sources since Nigeria is blessed with these. It was also recommended that foreign investors should come to Nigeria and invest in the energy sector, particularly in the area of renewable energy since these sources holds good for the future of the world.

**Key words:** Renewable, energy, Nigeria, solar, wind, bio, agro.

## INTRODUCTION

The current global energy problem can be attributed to insufficient fossil fuel supplies and excessive greenhouse gas emissions resulting from increasing fossil fuel consumption (Chen, 2010). In Nigeria today, burning of fossil fuel for electricity generation is the order of the day. Almost every house hold in Nigeria has a generating set. Banking industries and telecommunication companies use generating sets to run their businesses. The power holding company of Nigeria generates over one thousand mega watt of electricity via thermal stations. And these thermal stations use up gas supplied to them via the National Gas Company. Whenever there are hitches in gas supply electricity supply will be affected. In the Nation news paper of 8<sup>th</sup> June, 2011 the PHCN boss gave reason for the low power supply in the nation. According to him: "Power generation has dropped from 3700

megawatts (MW) to 3200MW, indicating a loss of 500MW". The Managing Director of PHCN, Alhaji Labo Hussien, told the Nation's correspondent that the drop was as a result of shortage of gas supply to the thermal power stations. This has resulted in blackout and load-shedding in some parts of the country (Ugwuanyi, 2011).

The fact is that burning of coal and gas to generate electricity is not the solution to the energy problem we have in Nigeria. The reason is that the crude oil reserve is dwindling seriously and very soon it would be exhausted (DPR, 2010). The second reason is that the burning of fossil fuel is seriously contributing to the global warming, which the UN summit on climate change tried to address (Figueres, 2011). The third is that there are many alternative energy sources that are more environmental friendly which the Federal government could invest in. Examples are the solar, the wind, the bio, the hydro and the agro sources of energy. Looking at the solar source, it is amazing the amount of Energy being delivered to the earth by the Sun each day (120,000

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terawatts, according to Chen, 2009). This energy if properly harnessed could mean well for Nigeria.

### **The federal government of Nigeria's commitment towards development of renewable energy in Nigeria**

The federal government of Nigeria's commitment towards development of the renewable energy is evident in her drafting of the renewable energy master plan project for Nigeria. Nigeria's National Economic Empowerment and Development Strategy (NEEDS) strongly emphasized the need for rapid and sustainable development of the energy sector. It envisaged an increased role of electricity in spreading the development network into rural and semi urban areas. The Federal Government of Nigeria has in several policy documents clearly articulated its support for rural electrification and the imperative of establishing a comprehensive framework for rural electrification and renewable energy policy options. In 2001, the Federal Government of Nigeria outlined a National Electricity Power Policy (NEPP)<sup>2</sup> with emphasis on encouraging a "full menu of rural electrification options – grid, off-grid, mini-grid, non-thermal and renewable energy". The NEPP is backed by the Electric Power Sector Reform Act enacted in March 2005. To accelerate rural development, the Federal Government is strongly committed to expanding access to electricity in rural and semi urban areas. A comprehensive framework for rural electrification policy and strategy that meets international standards and best practices is being developed by the Federal Ministry of Power and Steel. In recent time, the Energy Commission of Nigeria (ECN) has finalized the development of a Renewable Energy Master Plan (REMP) for the country which was presented and discussed during a national workshop in August 2005 (Good, 2005). This plan will set-out a 20-year vision and roadmap for renewable energy to play an increasingly important role in the Nigerian economy. The convergence of resource abundance (including large and small hydro potential, solar radiation, biomass, and wind), advances in technology and expanding market opportunities for renewable energy generated electricity, underscores Nigeria's drive to develop a framework and appropriate business models to deliver power to the over 100 million Nigerians without access today. In the First National Communication under the United Nations Framework Convention on climate change (UNFCCC), the Federal Government of Nigeria clearly articulated the potential role of renewable energy in meeting Nigeria's global commitment to managing future emissions of Greenhouse gases.

### **NIGERIA AND ITS RENEWABLE ENERGY MASTER PLAN**

Nigeria is the most populous country in Africa, with an oil-

dominated economy. Renewable energies have not played a major role in its developmental efforts so far, in spite of the abundance of these energies in Nigeria. In order to restructure its power sector in a more efficient manner, and provide a sound basis for economic development, Nigeria has embarked on a large scale energy sector reform programme that includes widening the range of options for generation with increased use of gas resources and renewable, and enabling the expansion of access to peri-urban and rural areas (Good, 2005). A National Renewable Energy Master Plan project has been finalized and set in motion. The draft Renewable Energy Master Plan proposed the setting up of a National Renewable Energy Development Agency (NREDA), to oversee the development of renewable energy in Nigeria. The master plan project is in the custody of Energy commission of Nigeria under the Federal Ministry of Environment. This project was set in motion in fulfillment of the Federal Republic of Nigeria's obligation as part of African strategy on emission reduction (FME, 2010). The long term renewable energy master plan for Nigeria is to address the challenges of moving towards clean, reliable, secure and competitive energy supply which is long overdue. The general aim of this master plan project is to reduce emission of greenhouse gases and reduction of poverty, by ensuring that the rural population has access to electricity. The specific objectives include (FME, 2005):

1. To develop and implement strategies that will achieve a clean reliable energy supply and establish mechanism to develop the sector based on International best practices to showcase viability for private sector participation.
2. To set up and implement integrated Renewable energy programmes that are expected to provide inputs to national sustainable development and agenda to meet the followings targets:-

- National Agenda on Emission reductions
- Millennium Development Goal;
- Vision 20: 2020 Environment sub-sectors;
- Clean Development Mechanism
- Federal Government Programme on development on alternative sources of energies that is clean and sustainable
- Generation of local employment
- Local capacity building
- Market development
- Local and global environmental benefits

3. To reduce projected energy use by 20% by 2020 and meet 20% of the nation's electricity needs with Class 1 renewable energy sources by 2020. The combination of energy efficiency, conservation, and renewable energy resources, should allow Nigeria to meet any future increase in demand without increasing its reliance on

non-renewable resources.

### Advantages of renewable sources of energy over burning of fossil fuels

The renewable sources of energy have the following advantages over burning of fossil fuels for electricity generation.

1. They have little or no environmental challenge. The pollution arising in the case of thermal stations from combustion of fuel is not environment friendly due to the fact that sulphur oxides, heavy metals, radio-active elements, hydro carbons and large quantities of carbon dioxide are emitted which leads to acid rain.
2. Renewable sources of energy are replenished naturally while Fossil fuels are finite and nonrenewable.
3. In the case of burning of nuclear fuels as in nuclear reactors, radiation problems usually result. And this is not good for the human health. In the case of accident there are usually serious health challenges that result. An example is the case of Japan's fucoshima nuclear plant accident. Special system designs are required to prevent radioactivity release during normal operation or due to accidents. Major portions of a nuclear plant are radioactive during and after operation, requiring special precautions and advanced technology for maintenance of such plants. The Federal Government of Nigeria under the leadership of President Umaru Musa Yaradua had proposed nuclear option as the other and only solution to the Nigeria's energy crisis. Nuclear power plants fuels usually require remote handling and special processing and disposal of toxic waste whereas renewable sources of energy do not require that.

### CONCLUSION

In Nigeria, as in many developing countries, providing energy to rural and urban areas has proved to be a great challenge. Nigeria as a large oil and gas economy poses an uneven playing field for renewable. There is substantial flow of resources and policy attention to the fossil fuel sector.

This makes it difficult for renewable energy to gain a foot- hold. Certain subsidies for fossil- fuel conventional energy technologies create a barrier for renewable energies to achieve a higher market share. Presently, technology imports for conventional electricity production carry a much lower tariff than renewable energy electricity technologies. This hampers the growth of renewable energy technologies. All along, the Federal, State and Local Governments formulated policies towards increasing rural energy access have all along focused on grid extension and tanker distribution of petroleum products. With increasing population, the pressures on the infrastructure for the supply of conventional energy resources will continue to increase.

Again, conventional energy is depletable with extinction risk. In order to enhance the energy security of the country and establish a sustainable energy supply system, it is necessary to promote the policy of diversifying the energy supply so as to include alternative or renewable resources and technologies into the nation's energy supply mix. Nigeria is blessed with abundant renewable energy resources like solar, wind, biomass, small hydro, etc., which have minimal or zero supply logistic problems.

Harnessing these resources leads to decentralized use and local implementation and management, thereby making sustainable rural socio-economic development possible through self-reliance and the use of local natural resources. For this to happen, the policy makers should make renewable energy development a priority policy statement of government at all levels in Nigeria. Lawmakers should develop appropriate legal, regulatory and institutional frameworks that de-emphasize over-dependence on fossil fuels. By so doing, renewable sources of energy will gain ground in Nigeria.

### RECOMMENTION

Nigeria is a great country, blessed with abundant renewable energy sources. It is therefore recommended that the development and use of renewable sources of energy be encouraged in Nigeria. It is also recommended that foreign investors be encouraged to come to Nigeria and invest in the energy sector of its economy. Lastly, Government should encourage researches in the area of renewable energy in order to enable rapid development of the technology in Nigeria.

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