



RENEWABLE ENERGY DEVELOPMENT IN NIGERIA: MORE THAN ENVIRONMENTAL ISSUES

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It is an indisputable fact that the country in which people are raised in will greatly shape their lives and significantly limit or enhance the opportunities that life can afford them.

One of the significant factors that shape people's opportunities in different countries is the availability of energy. This is reflected in a strong statistical correlation between people's energy consumption and their economic output (Boes et al, 2003). The reason for this relationship is the reliance of almost all the world's economic activities on the availability of energy.

A nation reaches energy security and vis-à-vis, economic maturity, when the energy available in that country is sufficient and affordable so that no constraints are imposed

on people's lives and the economic activities the people engage in (Boes et al, 2003).

Energy shortages do sometimes occur even in developed countries. When such shortages occur, they commonly lead to price increases and thus affect the disposable income of each individual in the country. However, while these types of energy shortages only temporarily affect the availability of energy in developed countries, in Nigeria, acute energy shortages for

many years now have led to perennial and regular electric power outages, with serious consequences for economic development, citizen safety and the quality of life of people in Nigeria.

Over the past 20 years, perennial power outages have transformed the once vibrant Nigerian nation with lots of economic potential to a nation whose economic livelihood breathes solely on the volatile and dwindling fossil fuel.

Over these twenty years, population surges in the cities have translated into proportionate huge and overwhelming demands on electricity. Unfortunately, absence of any concise government policy and strategy to diversify energy development for Nigeria has gotten the only source of electric power supply system too stressed to sustain any meaningful economic development in the country. The consequences have been abject neglect of grass root economic development, erosion of social order and threats to citizen safety.

Even in the cities that traditionally were the foci of economic activities, any new business startup must first budget for a massive investment in reliable source of electric power and clean water, besides arrangements for property safety. These extra investments have become challenging hurdles that very frequently discourage such new business startups and have also spelt doom to existing businesses.

Over these twenty years of economic development meltdown, the consequent growing poverty and the lack of opportunities for young city dwellers and in the rural areas have been the major contributing factors to the breakdown in social

order, political instability and breeding ground for criminals and local agitators. It is little wonder therefore, that safety has become top in the list of citizens' concerns in Nigeria. Unlighted streets, businesses and homes have become easy targets for and provide attractions for the armed robbers. Families and business entities who can afford it have resorted to generators for their electric power needs. These generators are not only expensive to maintain, but are also sources of undocumented but potential huge increase in air and

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noise pollution in the cities. In order to protect the generators from theft, families typically resort to cage in their units within the family homes. The result is a dangerous exposure of families to carbon monoxide poisoning, besides irritating noise pollution. Documented cases of families who went to bed at night but could not wake up the next morning; obviously due to carbon monoxide poisoning are common newscast.

The strategic interest of Nigeria in terms of national security, citizen

safety, grass root economic growth, social order and the health of Nigerians, will potentially be enhanced by a revamping of Nigeria's current energy supply system. And since any new energy strategy must embrace the new paradigm of global environmental sensitivity and the reality of dwindling fossil fuel source, a concerted investment effort to develop renewable and alternative energy systems in Nigeria must be a major part of any new energy revamping strategy for the country. Access to renewable energy is considered a prime contributor to overcoming poverty, delivering good education and health services, creating enterprises, and generating employment and incomes (Koppinger et al, 2007).

Viable Options

Energy diversification is a key enabling factor that will stem the prevailing state of crime, access sufficient quantities of clean water, maintain acceptable standards of food and goods production, sanitation, and health for the citizens of Nigeria. Alternative and Renewable Energy (RE) Development in Nigeria is a key component of the energy diversification strategy and a catalyst to the needed grass root economic growth of the country. However, in order to bring this urgently needed energy revolution to reality, the following action items must be implemented:

- **A Diversified Energy Strategy**
 - ♦ A well thought out energy diversification and development strategy that incorporates

renewable energy sources; Solar, Wind, Biomass, etc, must be embraced and developed by the government of Nigeria.

- The Federal and state governments in Nigeria must demonstrate commitment to this revolutionary new energy system and not pay lip service to this urgent energy need.
- The Federal, State governments and Economic planners in Nigeria must develop the mind set that a sound and well coordinated energy policy, which includes renewable energy systems, will play a key role in supporting political stability in Nigeria.
 - In social/infrastructure development and
 - In grass root economic development

Urgent and Bold Action

- Besides showing commitment to any new energy strategy and policy by the government and economic planners, a bold action that includes a break away from the traditionally associated way of executing and running government projects will be key to the success of the new energy policy.
- In the past, even when government has earmarked progressive projects, the government itself has usually become a cog to the wheel of executing such projects. The prevailing energy shortages and perennial power outages in Nigeria may partly be blamed on inefficiency, corruption and unreliability of the government owned and run electric power

development authority. Solar, wind power and other decentralised renewable energy sources will help get around the problems traditionally associated with government run agencies, and will provide a desirable competition among energy providers. Mobile phones in Nigeria provide a clear example. For decades, people in Nigeria have had to put up with expensive and unreliable poorly designed telephone network controlled by inefficient and corrupt bureaucrats. However, over the past five years, entrepreneurs have built cellular-phone networks that, in effect circumvent the national telephone system. Five years ago, Nigeria had few mobile phones, but a new study shows that more mobile phone connections have been turned on in Nigeria in the past five years than land-line connections in the past twenty-five years. The rest as they say is history.

- The government must assure current electric power generators and utility companies that investment in renewable and alternative energy is no threat to their existence, but rather a great supplement that will free up their efforts to concentrate their services more efficiently and more effectively to major power consumers in the country. Moreover, current utility companies can and should be part of the new energy development.
- **Partnership**
 - The task of developing and incorporating alternative and

renewable energy sources in Nigeria are too important and so urgently needed that the government of Nigeria cannot take them on alone. The following must be part of bringing this energy revolution to reality:

- **International Organisations** – Assistance from NGOs with proven technical and management expertise in the new energy sources – Solar, Wind, Biomass, Hydrogen, etc; must be solicited. Nigeria must not be shy to seek out and ask for these technical, management and even financial support from international bodies; after all, recent economic trends in the world have shown that local instabilities in countries such as Nigeria may easily cause destabilising ripples in the global economy. The world also has a stake in a stable and secure Nigerian nation and Nigerian market.
- **Renewable Energy Market Facilitators and Developers** – Local availability of technical and management skills will most certainly set limits on the extent of success of this new energy development. This is where Nigeria must tap into the expertise of Renewable Energy Market Facilitators and Developers (REMFD) to facilitate renewable energy project development, technical information exchange, partner matching, local expertise

development, market and technology assessment and technical innovation adaptation of renewable energy products to local need.

- ♦ **Financial Institutions and NGOs** – Nigeria will have to partner with commercial banks, multinational organisations and local public lenders to provide finance to Renewable Energy Market Facilitators and other renewable energy entrepreneurs and credits to consumers. The Federal and State governments must show commitment and come out convincingly in support of creating and strengthening of market facilitators with proven expertise. The government must provide the support without becoming part of the problem.

Suggested Immediate RE Project Applications

The following recommended RE projects, if immediately embarked upon by the Federal and State governments in Nigeria, would help to showcase the vast opportunities and positive economic transformation that the new energy sources can bring to Nigeria; these projects have the greatest potential to immediately impact positively on the lives of Nigerian citizens. The projects will also catalyze the process of the needed grass root economic development. These projects are related to (a) decentralised electric power generation for targeted health

facilities and schools, (b) social projects/community quality of life improvement, (c) citizen development and (d) venture capital development. Partnership of the Nigerian government and local financial institutions are necessary to initiate the seed fund that will make these projects possible. Expertise of Renewable Energy Market facilitators will be invaluable to the government to facilitate development of the suggested renewable energy projects.

♦ **Decentralised RE Electric Power Generation**

♦ **National Medical Centres and University Teaching Hospitals**

Citizens' health seems to have rightly become a national priority of the Nigerian government. Recently the government has designated some hospitals as National Medical Centres. The hope is to consolidate and improve health services in each of the designated centres so that each centre will have adequate resources to provide acceptable standard of health care service to the citizens. However, the availability of electricity to support these medical centres has been less than adequate. The result and reality are that these centres remain no better than most of the other ill-equipped health facilities dotted all over the country. The inadequacy of these well intended "magnet" health centres is borne by the fact

that Nigerians who can afford it, continue to spend millions of naira each year to seek for health treatments outside the country: India, US and in Europe. This has translated to capital drain on the financial resources, and a stagnation of health care expertise development for the country.

The relationship between health vis-à-vis national economy and energy is very significant. The World Health Organisation (WHO) states that health and energy are interdependent factors, which largely determine the progress of any nation's development.... A national energy strategy will be critical in achieving lasting health improvements. ...WHO believes that solar and wind energy can play important roles in improving health and infrastructure development if integrated with a broader array of end uses (Koppinger et al, 2007).

Gasoline and diesel fuels are typically used to power motor generators for electrical services at these National Medical Centres. The generators are often nonfunctional, generally expensive, and usually reserved for emergencies when available. The result is that much of the time, most of these centres are without electrical power. Renewable energy from sun and wind is an abundant and ubiquitous resource. Although, capable of providing plentiful and reliable electricity, these resources are largely untapped in Nigeria. Reliable electricity generation on site at each of these centres will be capable of delivering high quality electricity for surgery, vaccine refrigeration, lighting,

communication, medical appliances, clean water supplies, and acceptable standard of sanitation at these centres. These are basic necessities that each of these centres must have in order to provide reliable and acceptable standard of health care service for the citizens. Electricity offers a quality of light to which gas or kerosene operated generators cannot compare. Kerosene contributes to poor indoor air quality well. Electric light on the other hand greatly improves emergency treatment, surgery, administrative tasks, and other medical functions (Kapadia, 2004).

The Nigerian government can tap into the resources of Renewable Energy Market Facilitator and Developers to develop off-grid Solar and Wind energy to power as many of these National Medical Centres and University Teaching Hospitals as the Nigerian government recommends and help improve health care delivery at these centres.

- **Federal Secondary Schools**

The importance of basic education is not for citizen development, but also for specific training in fields such as agriculture, teaching, engineering and health, and has always received top priority in Nigeria. Nigerian government and economic planners understood that education allows people to acquire special skills and become more productive citizens. While it may be debatable whether

education still holds its priority place in the strategic interest of Nigeria, there is little doubt that energy can contribute greatly to re-stimulate and invigorate interest in this key social service and important national strategic component. Unfortunately, the current perennial power outages do not enhance environments conducive and opportunity for quality education. Nigeria simply cannot afford a generation of uneducated or poorly educated citizens. No country in the modern world can survive with mediocrity of education let alone uneducated citizens. The soul of any nation simply dies when learning stops. As more effective and efficient teaching methods are developed, simple electrically powered audio-visual aids will facilitate access to quality education in Nigeria. These study aids vary from advanced distant learning through the internet or with interactive software to audio-visual aids such as video supporting classroom and training programs, and cheap and effective distant learning methods for basic adult education programs transmitted by radio and cassette (Kapadia, 2004). School kids and adults previously cut off from electronic information, education, and entertainment can become part of the modern world.

In all cases electric power availability and adequate lighting can help extend the “learning” day and expand the “learning” opportunities (Kapadia, 2004).

Electric power availability can also help teachers working in rural areas to increase their standard of living and motivate them to stay. It also allows them to prepare classes at night and stay informed, through internet, radio and TV, which should have their effect on the quality of classes (Kapadia, 2004). Students will have more access to information, via the internet, and lighted schools can become focal point for the community, with great potential for the integration of community development and educational goals. Electric light will help improve literacy, because people can then read after dark more easily than they can by candle or lamplight. Schoolwork will improve and eyesight is safeguarded when students study by electric light.

Nigerian government may enlist the expertise of Renewable Energy Market Facilitators and Developers to develop decentralised off-grid Solar and Wind energy to power as many of the government secondary schools as the government may recommend.

- **Community Health Centres**

In the rural areas of Nigeria, the tragic risk of women dying during childbirth is all too well common. While many intervention factors such as providing women with access to better nutrition, education, and training of rural midwives are necessary to stem

this tragedy, there is little doubt that energy availability will play an integral part in improving rural health facilities. Malaria, Cholera and other water borne diseases still kill, blind and has disable many Nigerians in the rural areas. Quite often, the Community Health Centres where available, are their first and probably their only opportunity to modern medicine and health care service. Health facilities need electricity for lights, for the refrigeration of vaccines and medicines, for conducting laboratory examinations like blood tests, and for communication facilities, like a telephone. It needs heat or electricity for sterilisation of equipment, for heating water and for general sanitation of health facilities and equipments. Trained staffs are also more likely to want to work and live near a health facility that has access to electricity (Kapadia, 2004).

Quality grass root health care improvement in Nigeria is probably one of the most important factors for the success of any intended grass root economic development of the country; after all, a healthy economy cannot be hoped to thrive on the backs of unhealthy citizens. The government will need to engage the services of REMFD to develop off-grid Solar and Wind energy to power as many of these community health facilities as the government recommends.

- ♦ **Social Projects and Quality of Life Improvement**

- ♦ **Community Social Projects: Drinking Water**

Use of renewable energy to provide clean drinking water is an important social service that will enhance the quality of health of Nigerian citizens.

Applications of RE technology in both mechanical pumping/filtering and ultraviolet (UV) disinfection are fast emerging. The government ought to aggressively explore these innovative sources of energy to provide this key social and community service to the citizens.

- ♦ **Local Expertise RE-Development**

- ♦ **RE Curriculum Course Developments in**
 - ♦ **Technical Schools**
 - ♦ **Universities**

Historically, one major reason cited for failed renewable energy projects has been due to the absence of know-how-transfer of the new technology to enhance local capabilities (Barnes, 2006). The executors of the new technology overlooked the needs for local technical training, maintenance service expertise development, user education and awareness.

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Renewable energy technicians obviously will need training and builders will need continuing education in renewable energy

construction techniques. And the public's psychic will need to be shifted to adapt their lifestyles to a changing energy system. The colleges of technology and the universities will need to be prepared and equipped to support the transition to the new energy system.

Nigerian economic planners must recognise that this new energy technology is potentially a major source of employment to thousands of young graduates and a grass root mobilisation of new world economy order in Nigeria. The government may therefore need to elicit the expertise of REMFD to assist the Ministry of Education to develop Renewable Energy academic program courses suitable for Technical Schools and Universities.

Conclusion

The economic stakes are high in Nigeria. National security is on the line. Citizen safety and restoration of social order are the issues. Alternative/Renewable Energy Development in Nigeria holds the key to the urgently needed grass root economic growth of the country. This inadvertently is tied to and inextricably linked with national security, citizen safety, social order and the health of people who live in Nigeria. Renewable energy development in Nigeria is much more than a response contribution of Nigeria to the new trend of global environmental sensitivity. It is a life line to the Nigerian nation. The Nigerian government and the Economic planners for Nigeria ought to recognise the importance and urgency of the energy need, and make the energy revolution become a reality in Nigeria. **opj**

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