

AN ASSESSMENT OF BARRIERS TO LOW CARBON DEVELOPMENT AND TECHNOLOGY TRANSFER IN NIGERIA

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Abstract

A low-carbon economy (LCE), low-fossil-fuel economy (LFFE), (Wikipedia, 2014) or decarbonised economy (Greenpeace, 2010) is an economy based on low carbon power sources that therefore has a minimal output of greenhouse gas (GHG) emissions into the environment biosphere, but specifically refers to the greenhouse gas carbon dioxide. Studies have shown that there are some barriers to low carbon development and technology transfer in Nigeria (ICEED, 2009). Weak or inappropriate institutional framework; funding inadequacy; lack of adequate policy frameworks; inability of R & D Institutions to embark on demand-driven research and development due to non-existing framework for Research/Industry linkage; poor branding and marketing skills for finished R & D products and services; inadequate commercialization infrastructure and platforms for proven R & D outputs; and very often, lack of capacity to identify the right people with vision and motivation to head the functional units are among the inhibiting factors to the development of new technologies that will ensure sustainable low-carbon development strategy for Nigeria and indeed other developing countries. Deployment of existing technologies suffers from shortcomings such as poor market development policies and regulatory frameworks and low skills availability in key areas. For development, demonstration and deployment of proven new technologies that support low carbon development pathway – absence of venture capital/risk funds, weak financial institutions and paucity of foreign direct investments in technology R & D in-country are among the most important inhibiting factors.

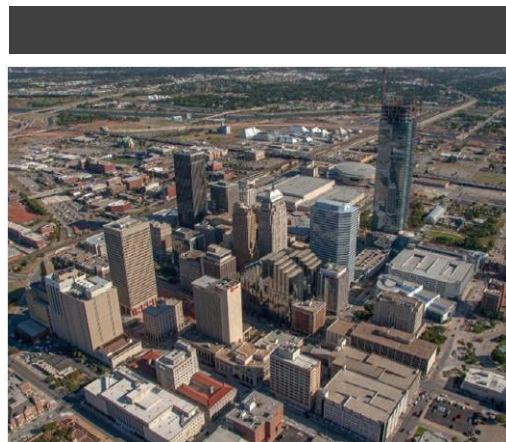
1.0 Introduction

Climate change is recognized as one of the most complex, multi-faceted, and serious threats the world faces. The response by the international community was the establishment in 1992 of the United Nations Climate Change Convention (UNFCCC, henceforth the Convention), as the global framework to address the climate change problem. The Convention is a comprehensive policy framework that outlines the principles for effort-sharing and ambitions to limit emissions. Guided by the Common but Differentiated Responsibilities (CBDR)

principle of the Convention, the actual response to the climate challenge is determined by the ability of individual countries to adapt or build resilience to a changing climate, while contributing to the global GHG mitigation effort.

Since the Convention was established, the enhanced understanding of the urgency to address climate change and the experiences from the Kyoto Protocol has led to negotiations focusing increasingly on engaging all countries in the global mitigation effort while reflecting the convention principle of CBDR. The concept of Low Carbon Development Strategies (LCDS) has been introduced by the Conference of Parties to the UNFCCC as a common but differentiated approach to meet the overall emissions reduction objectives: “*All countries shall prepare Low Emission Development Strategies ...nationally-driven and represent[ing] the aims and objectives of individual Parties in accordance with national circumstances and capacities*” (Cancun Agreement).

Low Carbon Development Strategies (LCDS) in this way become an overarching framework to design and achieve Nationally Appropriate Mitigation Actions (NAMAs) reflecting the CBDR of all countries (Lutken, S, et al, 2011). LCDS and NAMAs are not new concepts. They are a return to and reformulation of the very foundation for the global climate negotiations 20 years ago. When revisiting the text of the Convention, the formulations are strikingly similar to those that are being used today: “*Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change.*” (UNFCCC, Art. 3.4, 1992)



Heavily urbanized city in USA



A city in USA at night

2.0 Identified Barriers to Low Carbon Development in Nigeria: The barriers identified from the reviews of some national studies on low carbon development and technology transfer can be classified under the following:

2.1 Financial: (i) Poor Funding of R & D; (ii) Incompatible fiscal regime; (iii) Lack of appropriate incentives/subsidies in critical sectors with national comparative advantage; (iv) Difficulty in accessing credit; (v) High up-front cost.

2.2 Infrastructural: (i) Poor & Unreliable electricity supply; (ii) None existent water utility supply; (iii) Poorly equipped laboratories; (iv) Uncontrolled and non-regulated urbanization activities.

2.3 Regulatory and Policy Frameworks: (i) Existing laws and policies that may not be compatible with climate change mitigation and adaptation related measures; (ii) Lack of necessary policies, regulations, standards and codes.

2.4 Market: (i) Unstable market situation which hinders the procurement of international technological investment from donors; (ii) Low income among consumers.

2.5 Requisite Human Resource Capital/Capacity: (i) Lack of requisite skills/expertise in dealing with the various aspects of climate change related projects, i.e. greenhouse gas inventory, assessment of mitigation and adaptation options and their implementation; (ii) Lack of skilled personnel for the installation and operation of new and emerging environmentally sound technologies.

2.6 Social and Cultural: Social practices, beliefs and norms that prevent acceptance of climate change mitigation/adaptation options;

2.7 Lack of Advocacy, Awareness Creation/Informational: (i) Lack of access to information; (ii) Lack of access to relevant technical data; (iii) Lack of awareness about climate change-related issues, options for mitigation and adaptation, and advanced technologies; (iv) Lack of information about potential donors and project developers.

2.8 Organizational and Institutional: (i) Lack of a compatible or adequate organizational and institutional framework; (ii) Lack of coordination between the activities of the existing organizations and institutions that presently target climate change-related concerns.

3.0 Possible Domestic Actions to Overcome Barriers: However, some domestic actions required to overcome the above barriers may include:

(i) Increase budgetary funding levels substantially beside internally generated revenue through R&D activities such as patents and industrial collaboration; (ii) Provision of level fiscal regime; (iii) Review incentives and subsidy regimes; (iv) Review fiscal policies to remove barriers; (v) Seek international assistance which requires transparency in funds management and fiscal discipline from managers; (vi) Intensify efforts to improve electricity by sustaining the current massive investment and conducive environment for more private sector participation; (vii) Overhaul the national water utility sector as outlined in the water sector reform roadmap with good policies such as rain water harvesting, ground water recharge, effective waste water management and sea water reclamation; (viii) Provide adequate funding and seek international cooperation; (ix) Institute transparency and fiscal discipline in funds management and review current equipment purchasing system for better efficiency; (x) Improve geographical distribution of national laboratories and give adequate training, exposure to international standards and incentives to qualified research and laboratory personnel, especially the teeming youthful population in Nigeria; (xi) Review all laws that are in conflict with low carbon development strategy and enact a National Policy on Technology Development and Transfer as legal instrument for rapid development; (xii) Set processes in motion to enact relevant policies, regulations and Standards and codes, with appropriate implementation schedules and in-built oversight functions to fast-track sustainable low carbon development; (xiii) Provide relative stability in the market, especially in the currency valuation fluctuation; (xiv) Provision of the right macroeconomic policies and environment to improve income & wages; (xv) Set up special climate change scholarship programmes at postgraduate level with supervised research grants to develop promising scientists and skilled technocrats over a 5 to 10 year period; (xvi) Identify core areas requiring personnel training and incentives to orient them to societal needs as well as ensure that local knowledge is incorporated into mitigation and adaptation measures; (xvii) Promotion of local knowledge in mitigation and adaptation options through awareness creation and incorporation in school curricula at an early stage; (xviii) Set up various advocacy, informational and awareness programmes at National, State and Local Government levels on Climate Change, Mitigation and Adaptation of Climate Change and information on potential donors for the user industrial/commercial sectors; (xix) Media houses should be encouraged to devote specific programmes and sufficient time to climate change issues and programmes targeted at low carbon development pathway; (xx) Develop an adequate organizational and

institutional framework. Nigerian Parliament is currently doing this with the Climate Change Commission Bill passed in August 2009 but yet to receive Presidential assent; (xxi) Improve coordination and timely information and experience exchange and flow.

4.0 Technology Transfer as Barrier to Low Carbon Development: There are many steps that must be taken locally to promote the development and transfer of technology to Nigeria. An “**enabling environment**” which emphasizes the country’s objectives to achieve low-carbon development and utilize ecologically efficient technologies, while addressing its socioeconomic goals must be created in the country for technology transfer and development to take place and this must include the removal of barriers such as poor infrastructure, inadequate laws and regulations, shortage of skilled personnel, lack of finance, and ignorance of technology issues. There should be prioritized focus on the energy sector, as the biggest contributor to anthropogenic greenhouse gas (GHG) emissions. **Salau (2009)** suggests a few issues for consideration in the efforts to remove the barriers to innovation, technology development and transfer in Nigeria as follows: (i) Human and Institutional Development: The need for human and institutional development must be accorded a high priority. Human capacity is crucial for technological development and deployment. Specific and specialized skills are required for producing, modifying, innovating and operating, energy technologies or any technology for that matter; (ii) Policy Environment: It is increasingly important that clean energy technologies be given a more important role in long-term planning priorities and public/private investment strategies in our country. For example, undertaking power sector reform programme which includes a liberalization of the energy markets can promote more creation of IPPs and this can be a major driver for the diffusion of renewable energy technologies; (iii) Applied research and development: Public-sector programmes have particularly important roles to play in supporting research, development and deployment (RD&D) of technologies for adaptation and mitigation and catalysing greater private-sector investment as technologies mature. Private-sector investment is often the primary source of funding for technology deployment, diffusion and transfer of technology and thus must be meaningfully engaged and involved in Nigeria.

5.0 Nigeria’s path towards a Low Carbon Economy: There has been strategic approach to focus public policy to ensure socio-economic development, provide for environmentally oriented growth, and conserve biodiversity and natural resources.

Successes, however, include growth rates in gas utilization, greater emphasis on the energy sector as the highest source of emission resulting in complete privatization of the power sector and increased public sector investment in renewables with focus on areas for improvement regarding GHG emissions. In the case of the transport sector, the Government has reviewed the automotive policy with mouth-watering incentives to encourage local production of affordable and energy-efficient vehicles by the private sector with emphasis that the policy would decrease CO₂ emissions from the automobiles. Without the transfer of new technologies and requisite skills to developing countries through cooperative research via bilateral and multilateral platforms the goal to reduce energy intensity per GDP by 40% by 2020, will barely be achieved, and the objectives on renewables lag considerably in comparison to industrialized countries. The study for the projections and mitigation potential for long-term carbon emissions in Nigeria including the projections of GHG emissions in the energy sector; and decarbonization pathways, pillars and opportunities requires huge public investment in research and development. In the short-term the main solutions, might include: energy efficiency improvement; maximum decarbonization of electricity production; use of the abundant gas reserves in the country to generate electricity and fulfill domestic needs; increased use of renewables; and carbon capture and storage (CCS) technologies. Also worth mentioning the renewed focus of National and sub-National Governments on forests conservation and afforestation programmes in Nigeria noting that the sector is not only absorbing but also emitting and therefore a need to address carbon sequestration via afforestation projects especially in the Niger Delta region.

6.0 Conclusion: GHG emissions due to anthropogenic activity are increasingly either causing climate change (global warming) or making climate change worse. Scientists are concerned about the negative impacts of climate change on humanity in the near future. Globally implemented LCEs are therefore proposed by those having drawn this conclusion, as a means to avoid catastrophic climate change, and as a precursor to the more advanced, zero-carbon economy. In terms of large industrialized nations, mainland France, due primarily to 75% of its electricity being produced by nuclear power, has the lowest carbon dioxide production per unit of GDP in the world and it is the largest exporter of electricity in the world, earning it approximately €3 billion annually in sales. (Wikipedia, 2014 A). For Nigeria and other developing countries an “enabling environment” for innovation, research, development and deployment of eco-efficient technologies in the country should be put in place including policy and legal frameworks to ensure that obsolete technologies from

developed Countries will not be transferred to Nigeria as grants or loans. Nigeria should develop capacity to assess the impact of new technologies on the people and the environment through a set of programmes that leads to demonstration projects and capacity enhancement to ensure long-term sustainability.

7.0 References:

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