

CHALLENGES AND PROSPECTS OF RENEWABLE ENERGY USE AND REGULATORY MODELS IN NIGERIA: COMPARING WITH SOME OTHER CLIMES*

Abstract

Renewable energy is infinite energy which replenishes itself on a human time scale i.e nature's quick actions [solar, hydro, fusion of nuclear reactors, inverters etc] that are alternatives to fossil fuels commonly used in developing economies like Nigeria. This study examines its use, regulatory models, challenges and prospects in Nigeria as compared to some selected jurisdictions. The enormous benefits of renewable energy include: being carbon neutral; capacity to mitigate climate change by sequestering chlorofluorocarbon [CFCs] and other pollutants in the atmosphere; conservation and natural regeneration of biodiversity which enhances the carbon cycle, balances the ecosystem and creates job opportunities. Incidentally, Nigeria still uses fossil fuels due to the challenges of corruption, the ineptitude of successive governments, lack of technological know-how and specific legislative model which leads to role conflicts and confusion amongst agencies and stake holders despite the enormous benefits of renewable energy. This study finds fossil fuel effects to include; increased global warming, depletion of the ozone, a cut in the food chain, capacity of biodiversity and man going into extinction and other effects that currently stir us in the face. This study recommends the need for a specific legislation; merger of the multiple regulatory institutions, more judicial activism, to explore more on the abundantly available renewable energy types [solar, hydro and wind], increased taxations on fossil fuel use, collaborations with developed States and the State's will power to implement planned models to better tackle the challenges for enhanced prospects.

Keywords: Biodiversity; Environment; Fossil Fuels; Ozone layer Mitigation and Renewable Energy.

1. Introduction

This study focuses on renewable energy use in Nigeria, its implementation and effects on biodiversity and man via available legislations and regulatory institutions as compared to some States in Europe and the West African sub-region by examining the challenges and prospects in Nigeria. There is the need to transit to renewable energy due to its fabulous benefits against the conventional use of fossil fuels that is environment unfriendly, going obsolete and would soon deplete Nigeria's economic main stay!

2. Conceptual Clarification

Biodiversity is variety of life in all forms, that is, 'variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems as well as other ecological complexes.'¹ It is the abbreviation of biological diversity which in its simple and common meaning is – biodiversity which stands for the variety of living creatures; be they animals, birds or plants. It is the natural variability within the animal and plant kingdoms; the variety of species in any area. *Environment* is the system of abiotic and socio-economic components with which man interacts and simultaneous to which he adapts, transforms and uses in order to satisfy his needs.² *Fossil Fuels* are fuels such as coal or oil that is formed from decayed remains of plant or animal. Burning fossil fuels use oxygen and produce carbon dioxide... All fossil fuels are composed of compounds of the carbon and hydrogen elements.³ Meaning; they are fuels from old life forms that decomposed over a long period of time and the three most important fossil fuels include: coal, petroleum, gas and oil. Oil and gas contain hydrocarbons which combustion leads to hydrogen and carbon emissions into the atmosphere while coal which originates mainly from dead trees and leafy plants for instance, emits only carbons which are not environment friendly because they

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¹ GreenFacts available at: <https://www.freenfacts.org>biodiversity>. (Last accessed on March 17, 2018)

²L Atsegbua Akpotaire. V & Dimiwo . F; 'Environmental Law in Nigeria' [Theory & Practice] *Ababa Press Ltd, Lagos, 2003, p. 103.*

³ FOSSIL FUELS at: <https://www.collinsdictionary.com>...> (Last accessed on January 8, 2019)

cause global warming and ozone depletion which ripple effects are deleterious.⁴ However, this study finds these fossil fuels can be economic potentials if sustainably mined and the flared gas and carbons, trapped as currently explored by Total⁵ given the very high cost estimates for carbon capture of coal-fired plants at \$60 per metric ton and natural gas plants at \$70 reported by Fossil Energy.⁶ *Ozone layer Mitigation* means; 'a layer of gases that prevents harmful radiation from the sun reaching the Earth like CFC chemicals responsible for depleting the Ozone layer'⁷ which needs to be ameliorated being a dangerous situation or condition must be made less severe or intense.⁸ *Renewable Energy* is defined as sustainable act of increasing or renewing vigor or something or power used to provide heat, drive machines etc such that after not being strong, it is reinvigorated. Examples include; biogas, solar, hydro, nuclear, wind mill propelled energy supplies etc.⁹

3. Efficacy of Nigeria's Legislation and Institutional Models on Renewable Energy

Available legislations and institutional models on renewable energy in Nigeria, include: The Energy Commission of Nigeria [ECN]; The National Electricity Regulatory Commission [NERC]; The Nigeria Atomic Energy Commission; The Federal Ministry of Power and Mine; Federal Ministry of Lands, Housing and Urban Development; The Standard Organization of Nigeria [SON]; The Rural Electrification Agency; The Federal Ministry of Environment; The Federal Ministry of Water Resources; The National Power Training Institute of Nigeria and some of them discuss are;

Energy Commission of Nigeria [ECN]¹⁰ Act, [CAP E10] LFN, 2010

This was established by Act No. 62 of 1979 as amended by Acts No. 32 of 1988 & No. 19 of 1989 in line with the Declaration of Heads of Economic Community of West African States [ECOWAS] in 1982. Its mandate is to coordinate strategic national planning policies on energy for exploitation of various energy types and sources especially of renewable energy.¹¹ The Commission was also to gather and disseminate information, resolve and utilize inter-related implementation of energy guidelines, promote manpower training, development and to advise government at all levels on research, production and distribution of all types of energy.¹² The agency in its achievement however, created the departments of Energy Planning that came out with a Renewable Energy Master Plan and Analysis for renewable energy sources, conservation, demand efficiency and management.¹³ However, it failed due to its obvious slow pace¹⁴ and the absence of conditions for licenses / incentives to harness any form of renewable energy type.¹⁵

National Electricity Regulatory Commission [NERC], 2005 was established by the Electricity Power Sector Reform Act of 2005. Its aims are to promote, distribute, facilitate and maximize consumers' access to fair prices on electricity for services in both rural and urban areas.¹⁶ The Act further mandates

⁴Fossil fuels/ Environment/The Guardian at: <https://www.theguardian.com>fossil-fuels>. Causes black lung diseases in America that kills especially in the coal mines etc (Last accessed on January 8, 2019)

⁵Carbon capture and storage –Wikipedia at: <https://en.m.wikipedia.org>wiki>Carbo...> Where IPCC claims carbon dioxide can be captured out of air or fossil fuel power plant for gas using adsorption or carbon scrubbing, membrane gas separation or adsorption through technologies for an estimated CCS economic potential of between 10% and 55% of the total carbon emitted by 2100.

⁶The carbon-capture era may finally be starting – MIT Technology Review by Fossil Energy of February 20, 2018 at: <https://www.technologyreview.com>>. (Last accessed on January 8, 2019)

⁷Longman Dictionary of Contemporary English [3rd Ed.] 2010, p. 1015.

⁸ *Black's Law Dictionary* [8th Ed] Bryan A. Garner, 2005, p. 1023

⁹ F.O. Olumese; Personal emphasis/hypothesis/ concept

¹⁰ The Energy Commission of Nigeria [ECN] Act, [CAP E10] 2010 [LFN], 2004 earlier established by Act No. 62 of 1979 as amended by Acts No. 32 of 1988 & No. 19 of 1989

¹¹ N. Edomah et al; *Energy Transitions in Nigeria: The Evolution of Energy Infrastructure Provision (1800-2015)* at: <http://www.mdpi.com/ournal/energies<>>. (Last accessed on March 20, 2018)

¹² Section 5 (a) – (k), *Energy Commission of Nigeria Act [CAP E10], 2010 [LFN] 2004*

¹³ O. V Ojo; 'An Overview of the Legal and Regulatory Framework for Renewable Energy Projects in Nigeria: Challenges and Prospects' *University of Lagos Law Review Journal No.1.Vol.1. [2017], p. 32*

¹⁴T.T. Onifade; *Renewable Energy in Nigeria: A Peep into Science, A Conclusion on Policy* at: <http://www.wwhsrc.org/wp-content/uploads/2015/03/1J1SBT-4972.Onifade.pdf.<>>(Last accessed on March 20, 2018)

¹⁵ S. Musa et al; 'Power and Energy Law in Nigeria: The Journey So Far' *Nigerian Association of Law Teachers [NALT] Conference, Ebonyi State University, Abakaliki [2014] p. 17.*

¹⁶ Section 32 *Electric Power Sector Reform Act (CAP E7), LFN. [2010].*

the Commission to regulate tariffs by due process in consultation with stakeholders¹⁷ and to promote private sector participation to improve competition, enforce standard performance, safety, security, reliability, quality, licensing, generation, distribution and transmission of electricity through appropriate operational codes.¹⁸ This again is obviously absent going by their poor and very epileptic performance today! The Commission has however set the Multi Year Tariff Order (MYTO2.10) meant to support the proposed 2,000mw generation of renewable energy by the year 2020¹⁹ and to define generation, consumption and take-off prices.²⁰ The Commission has in line with the National Policy on Renewable Energy and Energy Efficiency, approved three window grid projects of (below 1mw small capacity metering; 5mw Solar, 10mw of wind and 10mw biomass feed-in-tariff and a 30mw of hydro capacity with competitive tenders above the NBET threshold²¹ that are all ironically yet to be achieved but for pockets of private individual efforts.

Nigeria Atomic Energy Commission of 1976 was established to coordinate research; develop the requisite legal model; man power; to introduce core Science Engineering training programmes and deploy, fast track, streamline, catalyze and harmonize nuclear power plant technology in selected Nigerian higher institutions for desired nuclear energy generation plants that other developed States like Germany are even opting out of due to the dangers from detonation. Even though in 1978, centers were established not only in Ahmadu Bello University, Zaria and Obafemi Awolowo University, Ile-Ife but a Nuclear Technology Center (SHESTCO) was also established in Shemda for research and training on nuclear technology and by 2010, two more nuclear research and training centers had been established in Port Harcourt and Maiduguri with the aim to apply nuclear technology studies on food, human health, water resource management prospects, to construct radioactive medical maintenance and mineral mines which success are yet noticeable in our ailing economy. The Federal Government has approved for the Commission, a three phase technical models meant to at least generate 1000mw of nuclear energy by 2017 and to be increased with 4,000mw by 2027.²² Surprisingly, nothing has been achieved in this regard even though better never achieved due to the dangers of nuclear detonation!

Federal Ministry of Power & Mines, 2010 is a Ministry charged with policy formulation to direct other power generating agencies, develop and deploy an energy mix that will assist power production investors and stakeholders on how to site hydro and solar energy in the North and Central region of Nigeria. It is also intended to develop 20% of total renewable energy to be consumed in Nigeria by 2030.²³ This study however, thought the Ministry ought to have driven the need to create a legislative model for renewable energy and as well create an agency that would ensure achieving set goals by 2030. This has become worrisome because the goals seem bleak come 2030 from the inability of the Ministry to put in place the desired access to energy intervention project plans and programmes that ought to foster, share, promote, build and support diverse network visions.

Federal Ministry of Environment, 1999 is one Ministry established to be responsible for preparing a competitive National Policy that would protect the environment through its Environmental Impact Assessment [EIA] on proposed projects.²⁴ It ought to promote and implement cooperative strategies

¹⁷Ajumogobia & Okeke; *Nigerian Energy Sector: Legal & Regulatory Overview, 2015* at: <https://www.aumogobiaokeke.com/assets/media/2b1394bed4259eb79881501c62092.pdf><> (Accessed on March 20, 2018)

¹⁸ *Section 32 of Electric Power Sector Reform Act [2005]*

¹⁹ Energy Regulation and Nigerian Markets Review Edition at: <http://www.thelawreviews.co.uk/edition/the-energy-regulation-and-markets-review-edition-5/1136421/nigeria><>. (Last accessed on March 20, 2018)

²⁰ GIZ, *The Nigerian Energy Sector: An Over view with A Special Emphasis on Renewable Energy Efficiency and Rural Electrification, 2015* at: <https://www.giz.de/en/downloads/giz2015-en-nigerian-energy-sector.pdf>.<> (Last accessed on March 20, 2018)

²¹The Nigerian Electricity Regulatory Commission, *Renewable Energy Sourced Electricity* at: <http://www.nercng.org/index.php/home/operators/renewable-energy>.<> (Last accessed on March 20, 2018)

²² NAEC; 'Welcome to Nigeria Atomic Energy Commission' at: <http://www.nigatom.org.ng>. (Last accessed on March 20, 2018)

²³The Law Reviews; 'The Energy Regulation and Market Reviews-Edition 5 Nigeria' at: <http://www.nigeriaelectricityhub.com/20/05/06/fill-speech-fashola-unviels-fgs-roadmap-for-solving-nigeria-power-crises/><> (Last accessed on March 20, 2018)

²⁴Ministry of Environment, *Renewable Energy Programme* at: <http://www.renewableenergy.gov.ng/about-rep/overview>.<>(Last accessed on March 20, 2018)

with international bodies connected with environmental protection for clean and reliable energy sources through a periodic master plan for redeploying environmental Science and Technology. It is to provide stable electricity supply, reduce greenhouse emissions, to encourage the use of alternative energy against fossil fuels. It was to also provide rural electrification and financial requirements to implement the conservation of natural resources, promote collaboration with other States and international bodies which execution has rather been close to nothing, nor encouraging with the current epileptic state of power generation, distribution and supply in Nigeria. The Ministry ought to provide outline of targets on reduction of greenhouse emissions, clean smoke-free cooking fuel as alternative to fossil fuels in Nigerian rural communities and to create awareness on the expected benefits of renewable energy.²⁵ In the mist of these, the polluter pays principle still persists.

4. Comparative Analysis of Nigeria Renewable Energy Use with China, European Union, Ghana, United Kingdom [U.K] and the United States of America

Nigeria's Model:

This study however finds Nigeria's models for transition into renewable energy use in Expo News Archives-Nigeria Alternative Energy [EXPO/NAEE] which aim is to scale up access to modern renewable energy services and supply against production which ought to have created job opportunities for Nigerians and that contrasts the Millennium Development Goals [MDGs] of 2015. Whereas, the Nigerian Sustainable Millennium Development Goals [SMDGs] targets job creation under the renewable energy scheme to reduce poverty. *Abi nitio*, Nigeria had hydro-energy under the Kainji and Shiroro dam schemes even though not elaborate but reasonable enough to drive renewable energy to prominent fruition by 2010²⁶ after Nigeria became signatory to the [2007] UN 2020 Agenda. Whereas, the renewable energy goals meant to be achieved include: Poverty reduction; development of a comprehensive and efficient renewable energy conservation plan that will feed into the National Energy Master Plan; promote not only a modern biomass but biogas and wind types of renewable energy. Also to encourage entrepreneurship incubation; human institutional capacity building; establish sustainable financial mechanisms and a pilot business resource centers. The development plan is spread over a five year period and to be funded by the following: Donors, who this study cannot discern; The Federal Government of Nigeria - that is insensitive to the plight of its citizens; and Government and Non-Governmental bodies.²⁷ The stakeholders, institutions for enforcement or implementation are under the Chairmanship of BGL-Taylor Dejohn [an international consultant] that is constituted by the Federal Ministry of Environment; Federal Ministry of Mines and Power; Federal Ministry of Water Resources; Nigeria Investment Promotion Commission [NIPC]; Nigeria Electricity Regulatory Commission [NERC]; Energy Commission of Nigeria [ECN]; Nigerian National Petroleum Corporation [NNPC] that is one of the multinationals that degrade and exploit the Niger Delta oil producing communities in the South-south of Nigeria and finally, the Power Holding Company of Nigeria [PHCN]. However, little success is being recorded in the following areas:

1. The establishment of a Ministerial Committee on Power ;
2. Partnership with other nations;
3. Improved technology;
4. Upgrading of existing hydro energy;
5. State visit to the NORDIC [The nine Norden / Germanic people of Northern European origin like Scandinavia, Finland, Denmark, Sweden Norway, Iceland etc] countries in 2010 with match making events and sign ups yet to be implemented;
6. Visits to power project sites for possible assessment;
7. Search for technical cooperation and support;

²⁵ N.V. Emodi; *Energy Policies for Sustainable Development Strategies Frontiers: African Business Research*, Doi10, 1007/978-10-0974-7_2 at: <http://www.springer.com/cdacontent/document/cda.../9789811009730-c2.pdf?SGWID,<>> (last accessed on March 20, 2018)

²⁶ M.F Akorode; O. Ibrahim; S.A. Amuda; A.O. Atuoze & B.J. Olufeagba; 'Current Status and Outlook of Renewable Energy Development in Nigeria' Nigerian Journal of Technology (NIJOTECH) Vol. 36, No. 1, 2017, Pp. 196-212. Also available at: <http://dx.doc.org/10.4314/njt.v3i1.25>. and at: www.nijotech.com. (Last accessed on January 21, 2019)

²⁷ Nigeria-Sustainable Development Knowledge Platform-the United Nations at: <https://sustainabledevelopment.un.org>.

8. The State signed some bilateral collaborations for financial, socio-economic and political assistance on the establishment of renewable energy in 2010 with nations; like Germany for economic security benefits and the promotion of inter-trade investments in the energy sector;
9. The State Entered inter-energy relationship;
10. The creation of Nigeria's Renewable Energy Day [NREDAY] to meet the nation's 20% energy needs with grade one renewable energy by 2020;
11. The interface with the different State Governors to develop or introduce renewable energy use into their respective States policies which are yet to be achieved;
12. Ministry of Power signed a Memorandum of Understanding [MOU] with the Ministry of Water Resources on small and medium scale hydro power generations for rural community use but yet to be noticed even though; all these were included in the 2017 budget for approval and implementation.²⁸

This study however finds that - the inefficiency in the creation and use of renewable energy opportunities in Nigeria is aside other challenges earlier mentioned in this work also due to corruption and the ineptitude of successive governments.²⁹ This study also finds that inter-solar renewable energy business connections are seriously ongoing globally and particularly in the Middle East.³⁰ This was where an international exhibition cum conference for solar enterprises took place in Dubai World Trade Center in 2017³¹ with a focus on electrical energy storage, cooling technologies, photovoltaics, solar heating etc. The conference also focused on the distributors, marketers and service providers who were to be made known on a later date and negotiations made possible at reasonable rates.³² A laboratory worth \$600,000,000.00 (Six Hundred Million dollars) was proposed for high scale guidance, investment and support network on Inter-Solar Renewable Energy use with more drive on large-scale private sector investments with public finances.³³ These innovations are made clearer under the Global Innovation Laboratory for Climate Finance or The Fire Award on India Laboratory Innovation for Green Finance.³⁴ The challenges that hinder achieving these laudable development plans unequivocally include: the lack of will power, adequate and proactive policy in place not to talk of corruption, the obnoxious legislations and ineptitude of successive governments.

The United States Independent National Research Council³⁵ reiterates that: 'sufficient national renewable energy sources exist to allow States play a significant role in future energy generation and thus help confront issues related to climate change, energy security and to check the soaring supply cost of fossil fuels which is unfriendly to the environment.' Agitation for enduring legislative models on sustainable climate condition connotes a reduction in carbon emissions which has always been an issue before the United Nations [UN] General Assembly following its several conventions on climate change which developed States like the United States of America [USA] are yet to comply with let alone Nigeria for reasons other than corruption, ineptitude, economic and technological challenges. Whereas, in developed States, deals on climate finance have been devised through trade-offs to wade off developing States from achieving sustainable development practices which indeed, limits the integration of renewable energy technologies into the development policy plans of developing States like Nigeria even though ironical, the developed States have forgotten that - pollution knows no boundary!

²⁸ Memorandum of Understanding for Hydro Power-Bureau of Reclamation at: [https://www.usbr.gov/hydropower-mou.](https://www.usbr.gov/hydropower/mou/) (Last accessed on January 21, 2019)

²⁹ *News Archives-Nigeria Alternative Energy EXPO/NAEE REPORT* at: [http://www.nigeriaalternativeenergyexpo.org/...](http://www.nigeriaalternativeenergyexpo.org/) (Last accessed on March 28, 2018)

³⁰ K. Muhammed & A. Kageneck A; *Inter - Solar Middle East Quick Facts* at: www.intersolar.ae/ (Last accessed on March 28, 2018)

³¹ Dubai World Trade Center Conference, September 25-27, 2017

³² *Ibid.* K. Muhammed and A. Kageneck Report respectively as (*Event Director and Project Managers*) on *Inter - Solar Middle East Quick Facts* still at: [www.intersolar.ae/en/for.](http://www.intersolar.ae/en/for/) (Last accessed on March 28, 2018)

³³ *Ibid*

³⁴ Tellar Typr; *Global Innovations on Renewable Iner-Solar Energy* at:

[www.climatefinanceideas.org/?gclid=COXEic2suNECCFUHhGwodVhUB-g.](http://www.climatefinanceideas.org/?gclid=COXEic2suNECCFUHhGwodVhUB-g) (Last accessed on March 28, 2018)

³⁵ National Research Council, 'Electricity from Renewable Resources: Status, Prospects and Impediments' *National Academies of Science [2010]* p. 4

China Model:

China's model is hinged on taxation which policy ambition is to reduce greenhouse emissions by 50% in 2020 as compared to year 2005. China has accomplished this by being signatory to the UN Framework Convention on Climate Change [UNFCCC] and thereafter, implementing through her *Ten Countermeasures on Environment and Development* that shows specific carbon intensity indicators from Copenhagen, 2009. Beyond that is the joint Legislative Affairs Council made up by the State Tax Administration, Ministry of Environment and the Finance Task Force that redrafted and incorporated increased Carbon Tax into Environmental Tax and other existing taxes on Liquefied Petroleum; Gasoline; Solvent Oil; Kerosene; Crude Oil; Naphtha; Natural Gas; Coke; Coal Products etc to reduce social cost, encourage the use of renewable energy products and equipment in other to achieve greening.³⁶ The Chinese government reduced taxes on renewable energy types like biogas and wind sources by 33% in 2003 and has continued to reduce taxes for consumers and producers of renewable energy products and equipment to enable a gradual transition into full use of these products. However, China has increased the value added tax [VAT] on industrialists that indulge in fossil fuel use which increases their operational cost. This is to compel renewable energy use and reduce the economic burden of the use of fossil fuels on citizens in other to discourage pollution, enhance the environment and healthy living. China has taken a queue from the United Kingdom considering the rationalized complications between the development and the environment.

European Union [EU] Model:

The EU model is also hinged on taxation which the State introduced on commercial coal and ignite, coke and semi-coke, electricity, natural gas, liquid hydrocarbon gas and petroleum businesses to boost climate change but exempts specific waste materials like heat, steam, oil, road fuel etc. In 2001, the EU made the fifteen European Union [EU] States sign a Mandatory Legal Commitments of at least 6-8% reduction of greenhouse emissions for which the United Kingdom [UK] committed at least 12.5% within the targeted time frame of year 2008 to 2012 without recourse to the plight of developing States like Nigeria. This gives cause for concern particularly that - the EU made it obligatory for member States to source for at least 3% renewable energy or contend either with the rigors of Polluter Pays Principle [PPP] or trade-off of emitted greenhouses or a combination of both (Polluter Pays Principle and the Trade-off effects of greenhouse emissions) without regards to the ability of developing States keying into this laudable venture. This again, gives room for worries because the EU introduced an Emission Trading Scheme [ETS] that initially covered only 8% but now covers 45% such that States with capacity below these limits, trade-off to those that exceed the limits from the year 2005.³⁷ This again, further triggered compromises by the poor developing States. Whereas, to accomplish this plan, the Carbon Emission Reduction Tax Target [CERTT] was introduced to encourage purchases of energy saving products (electric bulbs, smart meters and insulators) by home owners with at least 68% tax relief particularly for low-income earners in other to conserve energy and reduce domestic carbon emissions by 2008. The EU also passed the Climate Change Act of 2008 to bind member States with at least; 34% reduction of emission target by 2020 and 80% by 2050.³⁸ Finally; the UK introduced the 2011 Renewable Heat Incentive [RHI] to encourage and reward communities, businesses and home owners powered by renewable energy even though a Green Tax Reform Commission [GTRC] was established for the collaboration of European countries with experts, big energy enterprises, individuals, multinational industrialists, non-governmental organizations [NGOs], scholars, different government and non-government Ministries or organizations to get relief on climate change issues by being greening compliant! Dohar-Qatar Conference of 2013 obviously has unequivocal impacts on the [EU] agreements following the pledges to set up an international mechanism that compensates pollution victims for damages / loses which though, cushions victim's pain but may however never compensate them enough nor bring them back to status quo from irreparable loses like death. This is still a mirage in Nigeria considering the persisting polluter pays principle; the inability to get financial aid and

³⁶ Jia Lin LIANG; 'HuanbaoShuifa Shouci Jiang 'Tan Shui' Naru Qizhong [Environmental Tax Adopts Carbon Tax for the First Time] *Jingji Cankao Bao [Economic Information Daily] Beijing, May 5 [2013] p. 1* as cited by Haifeng Deng & Anna Wang; 'Constructing the Legal Safeguards for China's Carbon Taxation' *Journal of Sustainable Dev. Law & Policy, Vol. 4 [2014] p. 6*

³⁷ *Ibid*

³⁸ *Ibid*

technology transfer and in particular, the socio-economic inequalities between the developed and developing States. However, given the enacted Energy Bill of 2010 to encourage the implementation and use of renewable energy without financial aid or technology transfer to these developing States, not much may be achieved.

German Model:

Germany has made a success story in her renewable energy sector because of the State put in place; the Renewable Energy Sources Act called; *Ernieuerbare-EnergienGesetz* (EEG) 2000. This has been severally amended to accommodate the ongoing renewable energy use revolution and the latest was in 2017.³⁹ The Act is meant to facilitate renewable energy technologies on sustainable development and to at least respectively promote 35% and 80% continuous increase in renewable energy use and development by year 2029 and 2050.⁴⁰ A specific body (BNetzA)⁴¹ has been mandated to regulate / supervise electricity and issues of renewable energy grid⁴² and as well advice the German Ministry of Economics on energy issues.⁴³ German's mind blowing success on renewable energy includes: the specific mandate given the Energy Commission alongside the implementation of approved chargeable electricity rates by the Renewable Energy Act for the Public Utilities Regulatory Commissions.⁴⁴ This is to create and promote awareness on renewable energy use, advise the Minister on renewable energy issues, encourage the private sector and civil society participation on available renewable energy sources⁴⁵ whereas, there is no clear and specific provision towards this direction, in Nigeria.

Ghana Model:

In Ghana, Renewable Energy Act 2011 provides the necessary legislative model to develop and expand her renewable energy sub-sector.⁴⁶ Whereas, just the Ministry of Power oversees three main Technical Directorates (Distribution, Renewable and Alternative Energy Directorates (RAED) for implementation, execution and management of renewable energy projects initiative and programmes in line with the Renewable Energy Act under Ghana's energy sub-sector.⁴⁷

United Kingdom [UK] Model:

The UK government went into a bond with energy enterprises on 80% tax discount if the 50% emission reduction target is attained in 2020⁴⁸ by her *Emission Trading Market* and *Taxation Strategy Response* to climate change issues especially for being signatory to the 2009 UNFCCC Agreement. Her emission strategy is apt and more appropriate as it takes care of the regression that could occur from corrupt practices if the Emission Market Strategy alone is applied without taxes on the reduction of carbon emission since this is capable of making the entire energy industry loose competitiveness in the renewable energy market by the gaps from the effects of no carbon taxes and other economic benefits for establishing carbon markets. The taxes however, serve as incentives to reduce carbon emissions and to maintain a healthy competitive status quo amongst the energy enterprises. Again, the question is; what effort has Nigeria made in this regard?

³⁹ A. Groebel; *Role and Structure of the German Regulatory Authorities and the Role of BNetzA in implementing the 'Energiewende'* at: <http://www.iei-la./org/admin/uploads/nopa/groebel.pdf>.<> (Last accessed on March 26, 2018)

⁴⁰ Ibid

⁴¹ *Op cit* [Fn. 40] Federal Network Agency, *Bundesnetzagentur [BNetzA]*

⁴² Ibid

⁴³ Ibid

⁴⁴ Ibid

⁴⁵ Ibid

⁴⁶B. *Renewable Energy Policy Review, Identification of Gaps and Solutions in Ghana: Final Report* at: [http://www.enerycom.gov.gh/filesRenewable%20Energy%20Policy%20and%20Regulatory%20Gap%20Gap%20%20%20%20Analysis%20Final\(2015\).pdf](http://www.enerycom.gov.gh/filesRenewable%20Energy%20Policy%20and%20Regulatory%20Gap%20Gap%20%20%20%20Analysis%20Final(2015).pdf).<> (Last accessed on March 26, 2018)

⁴⁷ Ibid

⁴⁸United Kingdom Environmental Agency, *Climate Change Agreements Operations Manual [2nd Version of August 21, 2013]* at: <https://www.gov.uk/government/publications/climate-change-agreements-operations-manual-2><> (Last accessed on March 29, 2018)

United States of America [USA] Model:

Although the United States of America [USA] is one most developed global State but guilty of pollution by reneging her signatory to the 2007 Climate Change Conference. She has effectively used her Constitution to make Congress protect endangered species by providing internal administrative policies for agencies with minimum level of guidance to maximally protect public interest. The obligation of these agencies include: to encourage each contracting party [Agencies, Federal, State and Municipal level of governments) develop their own legislation on conservation and preservation / sustainability of biodiversity. Although, Congress relies primarily on Commerce Power Clause⁴⁹ to pass environmental laws which this study finds unsafe by the mediocrity likely to arise between the government and these agencies, over 500 renewable energy enterprises are steadily committed to renewable energy course with at least, 43% target in two years. Whereas, a total of 83 out of 215 firms hope to hit a 100% target of renewable energy use in 2017 through the RE100% initiative. In the same vain have Wal-Mart, General Motors and 20 other enterprises announced that their business operations are powered by renewable energy.⁵⁰ The prospect is such that, the American President Donald Trump whose unprecedented support for the use of coal fossil fuel now even opts for renewable energy partnership through his Advisory Council, to power his business enterprises.⁵¹ The importance of renewable energy has been reiterated by Michael Terrell when he said; 'We need to meet the growing needs of our businesses, industries and to generally help grow more space.'⁵²

However, by judicial activism, the Courts in USA permit Congress to use its power to virtually regulate any activity that has the most remote possible relationship with Inter-States Commerce except what involves the use of Intra-State Commerce channels, activities that threaten the instruments of Inter-State Commerce, things / persons and issues that substantially affect Inter-State Commercial activities as in the case of *United States vs. Lopez*.⁵³ This study finds that the USA Congress cannot regulate any activity that has impact on Inter-States Commerce however remote. The reason is that the power of the Police is strictly restrained to States as found in the case of the *United States vs. Lopez*,⁵⁴ where a slim majority of 4-5 was viewed by the Supreme Court as not substantially having any effect on an Inter-State Commerce Clause on gun carrying by a High School student. Unlike the decision in *Alphonso Lopez* that bans the possession of firearms within 1000 feet from any school despite the broad provisions in Inter- State Commerce that provides for conviction on the violation of environmental matters that concern Federal Gun-Fire School Zones Act.⁵⁵ However, the American Constitution⁵⁶ exclusively favours Federal legislations on: Asbestos, Fungicide, Insecticide, Rodenticide and Toxic Substances Control Acts that all regulate the use, purchase and sales of these products within Inter-States Commerce which falls within the power of the United States Congress Commerce Clause. By its provision, it is to regulate Inter-State Commerce where the traditional national statutes on Clean Air⁵⁷ and Water Acts⁵⁸ both regulate Inter-States Commercial activities. Hence, the efforts by the State to hold the disposal facilities and hazardous wastes generators responsible for the cleanup of land contamination have been argued over and successfully protested against that it now serves as checks and balance on the three tiers of government. This explains the reason for the refusal by a majority to covert Congressional Authority under the Commerce Power Clause⁵⁹ to Concurrent Power with the

⁴⁹ J. Salzman. & H.T Barton. (Jr.); 'Environmental Law and Policy' [Concepts & Insights Series of James Salzman & Barton. H. Thompson Jr. Ed.], *Foundation Press, USA [2003] p. 60* where Article 1, § 8 of Commerce Power Clause says; 'The Congress shall have Power ... to regulate commerce ... among the several States ...'

⁵⁰ RE100 Global Campaign available at: <https://www.cdp.net>articles>companies>. (Last accessed on January 04, 2019)

⁵¹ Julia Pyper, *Advanced Energy Economy [AEE]: Large Corporations are Driving America's Renewable Energy Boom* 2017 at: <https://www.greentechmedia.com/articles/read/Large-Corporations-Are-Drivind-Americas-Renewable-Energy-Boom.<> (Last accessed on March, 2018)

⁵² *Ibid*

⁵³ 514 U.S. 549 [1995]

⁵⁴ *Ibid*

⁵⁵ *Art. 1, § 8* provides; 'The Congress shall have Power ... to regulate Commerce ... among the several State...'

⁵⁶ Constitution of the United States of America, 1787 (States Ratified 2018)

⁵⁷ Clean Air Act [CAA], 1970

⁵⁸ Americans Water Infrastructure Act, 2018

⁵⁹ Art. 1 section 8, Clause 3 of the U.S. Constitution Commerce Clause, 2017 allocates power to Congress to Regulate Commerce among States, foreign nations and Indian tribes.

State despite the piled up inferences at Congresses: to covert Congressional Authority under the United States Commerce Power Clause.⁶⁰ It may interest us to know that till date, efforts by the United States Federal Land Use Regulations have repeatedly failed by the rejection of the Endangered Wetland Species Acts⁶¹ and the Clean Water Acts by some three Panel of DC Circuit Judges on the conviction that - these instruments were not connected to navigable waterways except where Federal funds / properties and Public policy supercede State needs. So, only the Congress best deals with ambient changes and uncertainties hence, most Federal policies are broad directives on specifics and only likely to change on evolving grounds. For instance, in *Yakus vs. United States*⁶² CJ Rehnquist reiterates that; State legislation should provide adequate standards or intelligent principles to constrain the decisions of agencies and the Courts to ensure that Congress faces difficult policy decisions in environmental fields and not simply put, politically contentious issues such as environmental pollution regulations to administrative agencies who in the absence of any constraint, will be tempted to duck tough policy decisions and even abdicate Constitutional responsibilities.

Further is the issue of prohibiting development even where government is not imposing cost on property owners but prevents developers from destroying the environment through unsustainable practices due to the adverse impacts of pollution on biodiversity and human, hence the Courts have challenges in discerning which regulation constitute takings that require compensation. However, American Courts have resorted to the classical case of *Ryland vs. Fletchers* (supra) to regulate government efforts in protecting the environment, other public amenities and to compensate property owners or victims of devastation in other to regulate the actions of property owners through what the Courts call the *ad hoc fact-specific basics* where:

- a. The Courts balance the extent of interference with distinct investment-backed expectations;
- b. The nature of interference and;
- c. The purposes of governmental regulation.

In the same vein, non-governmental organizations have taken an activists position like the National Audubon Society that succeeded the original Audubon Society founded in 1886 with about 40,000 members.⁶³ Others include; the Environmental Defence Fund of 1967 and the Natural Resources Defence Council of 1969 etc who through litigations under the Administrative Procedure Act⁶⁴ or Environmental Protection Act [EPA] or actions by other federal agencies inconsistent with the Commerce Power Clause, all worked to protect the environment but were unsuccessful due to its ineffectiveness. However, because the US considers paramount the health of her citizens, every environmental law passed since 1970 contains provisions for *Citizens Suit* except the Act for Federal Fungicide, Insecticide and Rodenticide drafted by the Agricultural Committee, and other than the more receptive Environmental Committee. Under the *Citizen Suit*, individuals or private persons can sue for the violation of their fundamental rights to enjoying the environment especially where government efforts have failed or tend to jettison justice for victims of environmental abuses even though, they actually are injunctive reliefs but there are financial sanctions permitted and payable to the US government instead of the individual whose rights have been violated. So, to help promote *Citizens suits*, the US Congress has ordered the Courts to make defendants reimburse plaintiffs and at least their litigation costs. This is done through *Attorney Lodestar fee*⁶⁵ where (reasonable Attorney fee is calculated by the time spent on the citizen suit by the plaintiff Attorney if he were in private practice) and paid to the Attorney by the defendant. This same feat, this study recommends for Nigeria especially with the multiplier effect and sanctions involved where the *Attorney lodestar fee* does not appropriately reflect the quality of compensation. The [1972] UN Declaration suggests prudent care and ecological balance of the environment to forestall irreversible devastation that today stirs us in the face. The Declaration asserts that:

⁶⁰ *Ibid*

⁶¹ Endangered Species Act, 1973

⁶² 321 US.414 [1944]

⁶³ National Audubon Society of USA, 1905

⁶⁴ Administrative Procedure Act [APA], Pub. L. 79-404, 60 Stat. 237, 1946

⁶⁵ Lodestar method-Wikipedia at: <https://en.m.wikipedia.org/wiki/Lodes>. (Last accessed on January 21, 2019)

Man is both creature and molder of his environment which gives him physical sustenance and affords him the opportunity for intellectual, moral, social and spiritual growth. In the long a tortuous evolution of the human race on this planet as a stage has been reached when through the rapid acceleration of science and technology, man has acquired the power to transform his environment in countless ways and on an unprecedented scale that both aspects of men's environment, the natural and the man-made are essential to his well-being and to the enjoyment of his basic human rights - even the rights to life itself. The protection and improvement of the environment is a major issue which affects the well being of people and economic development throughout the world. It is the urgent need of the people of the world and of all States in the world.⁶⁶

However, this study finds that renewable energy use is eminent because of its benefits of being clean energy, sustains the environment and supports life. The desire to deter acts that disrupt the carbon cycle and its natural cleaning functions through clearly specific legislation and institutional models, triggers this study and cannot be underestimated especially if the three principles of pollution mitigation in Nigeria are appraised with a focus more on the obsolete 'Polluter Pays' principle that still persistent in Nigeria.

5. Conclusion and Recommendations

This study finds it ridiculous that the international and regional legislations equally have problems of implementation just as our national legislations. Developed States that are signatories to transition to renewable energy use are bigger culprits of non compliance; hence more judicial activism is desired as in the case of *Uptal Brabara (Wing Commander) vs. State of Assam*.⁶⁷ This is to ensure orders of compliance in urgent cases of public nuisance and to apprehend danger, sustainable development through fossil fuels use by developing States, financial assistance, collaboration in transfer of technology, increased tariffs on fossil fuel use and more exploration of abundantly available renewable energy. For instance, solar, hydro and wind energies alongside specific enforceable legislative models, would propel the prospects of renewable energy use in Nigeria and worldwide⁶⁸ against the total absence / insufficient energy supply currently evident more in the rural areas especially that most rural households are not connected to the national grid. For prospects in renewable energy use elsewhere and Nigeria in particular, this study recommends the following measures. The State should urgently set up a clear and specific agency for renewable energy issues or better still, merge the existing ones. It should provide specific funds with the Central bank for easy access to renewable energy agencies and investors. The government should concentrate more on abundantly available renewable energy types like solar, hydro and wind rather than invest on nuclear energy considering the dangerous effects from detonation which developed States like Germany are now even opting out from. There should be collaboration on technology transfer and funding. Attempts can be made to mitigate the complexity of fossil energy through technological captures and a merger of the agencies with specific mandate on renewable energy. Nigerian government should adopt the hybrid systems for cultural and economic connection of the rural people in order to make them communal stakeholders in energy concerns and thus create awareness for renewable energy use in the various communities in Nigeria.⁶⁹ There is equally a need to establish a data base on renewable energy for build ups and future references amongst others.

⁶⁶ Ibid and specifically *AIR [2003] SC. 724, P.723*

⁶⁷ *AIR [1999] Gau 78*

⁶⁸ T.T. Onifade; *Renewable Energy in Nigeria: A Peep into Science, A Conclusion on Policy* at <http://www.wwhsc.org/wp-content/uploads/2015/03/IJISBT-4972.Onifade.pdf>.<> (Last accessed on March 20, 2018). See also *Ikenga K. E. Oraegbunam, MVC Ozioko & Chukwubi Kem J. Azoro, 'A Critical Review of the Legal Regime for the Maintenance of Environmental Standards in Nigeria: Bio and Hydro Energy Sectors In Focus' International Journal of Innovative Development and Policy Studies, 7(3):105-116, July-Sept., 2019.*

⁶⁹ Y. Oke; *Nigerian Energy and Natural Resources Law* [Notes & Materials, Lagos: Princeton & Associates Publishing Co. Ltd. 2016] p. 355