HEINRICH BÖLL STIFTUNG
NIGERIA

Green Deal Nigeria

The available supply of Renewable Energy will not be diminished for the foreseeable future – in millions or billions of years, it also serves to mitigate against pollution that protects our health and environment - a solution for a "sustainable green economy".

"Green Growth with Social Justice"

The Transformation from Fossil Fuel to Green Energy

Sustainable management of natural resources and the need for revenue transparency, subsidy reform and full deregulation

by *Ms. Lois Laraba Machunga-Disu and Miss Zumunta Machunga-Disu*

14/5/2012

The main objective of this study project is to highlight the capacity for a green transformation in strategic policy areas and to initiate a broad and in-depth debate.

CONTENT:

PREFACE

Notice

Proposals made in this document are based on JALZ Energy Ltd understanding of the requirements of the Client (herein named as HBS) and any inadvertent errors are regretted.

The information contained in this proposal ('Information') is for the purpose agreed by work order issued to JALZ Energy Limited/Ms Lois Laraba Machunga-Disu/Zummunta Machunga-Disu. Client is permitted to disclose the information only to those of its employees and/or professional advisors who need to have access to it and Client will notify such employees and/or professional advisors of the terms of this understanding.

8.1 Introduction:

A nation's economic wealth is traditionally defined and measured through gross domestic product (GDP), which is often created through the exploitation of natural resources. These Natural Resources in broad terms includes: Forests-Land, Crude Oil, Natural Gas, Solid Minerals e.g. Bitumen, Tin, Limestone, Columbite, gold, Iron Ore, Coal etc., Marine and Aquatic resources e.g. fish, shrimps etc.

Although increasing from a two digits figure, compare the relative low gross domestic product (GDP) state of Nigeria's economy of an annual average of $174 billion in the last five years with that of Walmart's, a USA retail outlet, of $260 billion revenue, and the total United States of America's $14.5 trillion economy[1], begs the issues arising. Also not further than Africa, compare South Africa's GDP economy of $363.7 Billion and Nigeria's $193.67 Billion US dollars at current prices in 2010[2]. In tandem, the Nigerian Bureau of Statistics (NBS) reports that the proportion of Nigerians living in absolute poverty – that is, those who can afford only food, shelter and clothing – jumped to 60.9 per cent in 2010 from 54.7 per cent in 2004. Of the estimated population of 167million, 100million live on less than a dollar a day, as well as have no access to electricity. Also about 30 million household still use wood for cooking in Nigeria. Nigeria has a per capita income of about $1,000 and amongst the most conflict ridden in the world. This is in spite of, in the past 58 years of oil, streaming over $500 Billion of revenues in the period (aside the uncalculated losses).

Nigeria's hydrocarbon natural resource (crude oil and natural gas) in spite of its abundance and as the mainstay of over 80% of revenues to the nation, has NOT served as a catalyst for economic growth neither has it served as the major source of energy in the mix of energy supplies. *Indeed petroleum only contributes about 10% as share to total domestic energy supply/consumption with over 83% arising from combustible energy, wood burning in particular.*

There exist abundant evidence that climate change (CC) is a severe threat to socio-economic development and can substantially affect a nations GDP, as it affects water, forest, sanitation, food security, industrial development, housing, energy, health and the very air we breathe.

The focus of this paper is on crude oil and natural gas, and its relationship into the 'green deal Nigeria' activities; energy supply from fossils increases the impact on CC and the appropriate ways to deal with these through adaptation and mitigating strategies that will enable a transformation-transition to a green economy.

This chapter further elucidates aspects of the historical poor management of Nigeria's natural resources (fossil fuel-oil and gas); and emphasis is on opportunity loss arising from; wastages, losses from oil and gas revenues, poor governance structures, poor conservation planning, damages of oil spills, gas flaring, weak linkages between the upstream and downstream sectors

[1] AOL, 'Economic Misconceptions That Need to Die By The Motley Fool, , 14th Feb 2012

See full article from DailyFinance: http://srph.it/w3BUKU

[2] Source: World Bank, World Development Indicators

of petroleum due mainly to ingrained subsidies in both gas and oil products and which have limited investments in infrastructure to support even the growth of the petroleum sector itself.
It has resulted to a low-level, mono-economy base; earned Nigeria the tag; "resource curse" syndrome-common in countries that depend on oil for livelihood, attendant with a high CORRUPTION index. Added to it, are the consequences of development based on export of primary goods, which fails to translate those primary goods to consumable items and creates an industrial base.

The need for a paradigm shift to diversify the economic base from these natural resources with new sources of renewable and *sustainable* green energy economy is overarching goal as well as targeting improved human well-being and social equity, whilst reducing environmental risks and ecological scarcities, with a high green GDP.

"Sustainable development", as accepted by the UN, has been defined as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs."

This can be achieved, first, using our flared gas and tying the phase-out of fossil fuel to the reserves-to-production (R/P) ratio; to the depletion of crude oil reserves. Given production/reserve history, currently, places Nigeria at "Peak Oil" state, even though gas reserves remain very substantial. Impinging on this is the need for more domestic energy supply due to fast growing population to rise from current 160 million to estimated 250 million by 2025.

The emphasis of this paper is on the input of RE into electricity supply, which is essential for production of goods and services. Those RE sources are, secure, sustainable and competitive and have greater penetration of energy to rural communities and creates new industries and new technologies and further increases employment. Initially, it offers the prospect of partially replacing fossil fuels in transport, domestic cooking, hot water and cool air, while in the long run ensuring a low carbon green economy.

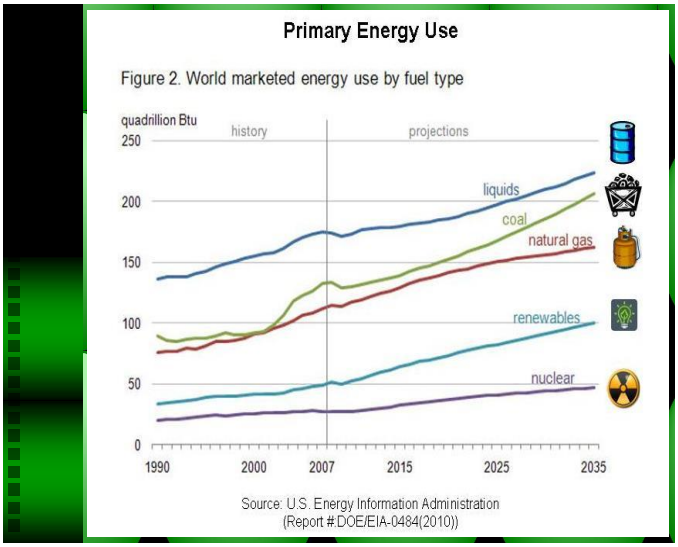
Management of natural resources
It follows from the picture painted about the state of Nigeria's economy and the state of the oil and gas sector that is a complete state of dialectics; it holds large reserves but is a depleting resource that expires or substantially declines in the next *perhaps* 15-20 years for oil and about 70 years for gas, which threatens the long term future generation. There is a need to address these elements.

Whilst these management issues and structural misalignments in the energy sector exist and are being addressed variously by the government, like the recent removal of oil product subsidy on 1st January 2012 and subsequent part reduction of the level of subsidy on petroleum motor spirit (PMS) from N65/liter (or $0.4) to N97/liter (or about $.60/liter), not only serves to reduce government deficit but should encourage investment in the sector, by a steady re-alignment of market forces.

Also the on-going review of the extractive industry and institutional and fiscal reforms under a revised Petroleum Industry Bill (PIB) and various committees are commendable.

8.1.1 Greenhouse gas emission (GHG) & Renewable Energy (RE)

GHG result from fossil fuel-based electricity generation-mainly, coal, petroleum, and natural gas and its derivative liquefied petroleum gas (LPG) and adds to concern about global warming. Alternative energies exist, in this case Renewable Energy (RE), which is energy that can naturally be replenished, those from natural resources such as sunlight, hydro, biofuels, wind, rain, tides, and geothermal heat. The key benefit of RE is that, it is also low carbon. The world supply of renewables is increasing, and at the end of 2008, it contributed about 19% of total world energy supply mix. Similarly, the share of renewables in electricity generation is rising; in the same period was around 18%, with 15% of global electricity coming from hydroelectricity and 3% from new renewables[3]. The growth of renewables has been strongest where and when the policy-makers in charge have established favourable conditions and policy.



According to REN21, the number of countries with some type of policy target and / or promotion policy related to renewable energy almost doubled during this five year period, from 55 in early 2005 to more than 100 by early 2010. Certainly, Nigeria is lagging behind on this, with several bills pending with the legislatures.

Furthermore, EIA projections demonstrate rising world energy use, arising mainly from developing/emerging countries, reaching about 43%, almost a match to industrialised nations at 45% of total world energy consumption at nearly 300 quadrillion btu by year 2025.

Nigeria's contribution to CO2 emissions is said to be about 0.2% of world output, based on current oil and gas production output. The actual CO2 levels in Nigeria are not clear for lack of adequate measurement data, but there is extensive use of wood burning in rural areas and kerosene in urban centers, petrol and diesel from generators. The emissions from generators, inefficiencies of energy use such us environmental degradation from spillages, vandalisation of oil infrastructure, gas flaring and alternative fuels are not accounted for herein. Gas Flaring alone is reported to account for 82% of total emission in Nigeria. Due to lack of electricity, the Nigerian Customs Services (NCS) reported recently, that over $350 million worth of generators were imported in 2010. General references to use of generators shows Nigeria's total power consumption may be up to 20,000MW, inclusive of generators. It is such a big letdown to see how the Nigerian National Petroleum Corporation (NNPC) and retail product marketing companies, knowing very well the toxic hazards and the former with Capital Oil, has the much touted scheme

[3] EIA data, 2010

of "operation direct kero", which dispenses the product on the streets in long queues of people with jerry cans. Similarly, a trip to the busy and highly populated industrial city of Lagos will convince you on how unhealthy the condition of air is.

It is recommended that Nigeria in the short term, needs to capture and utilise the gas being flared to reduce CO2, which will save the people's health and remaining forest and expand on green economy to have a greater reach to the populace that is largely rural.

International GHG Protocols

It has been over a decade that most countries joined an international treaty- (UNFCCC), to begin to consider what can be done to reduce global warming, for reducing greenhouse gas (GHG) emissions. This amounts to an average of five per cent, against 1990 levels over the five-year period 2008-2012. Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities." The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. 184 Parties of the Convention have ratified its Protocol to date, with Nigeria, a party ratified in year 2004. It is recognized that if GHG is not reduced, by the second half of this 21st century, a third of the world's population will suffer from lack of fresh water; food security will be impaired; small islands states may become extinct; and this is besides the weather vagrancies of floods, extreme heat and sea rise already being experienced.

Renewable energy technologies (RET)

Infrastructure development for power supply is a key factor for poverty reduction and contributes significantly to achieving Millennium Development Goals (MDGs). **Renewable energy technologies (RET)** offer prospects for a dynamic industrial policy. The deployment of RET in rural areas in developing countries offers opportunities for the use of local natural resources, for employment, and ultimately for institutional capacity. Even in industrialised economies plagued by unemployment and reduced growth perspectives, RET have proven to be an option of developing industries with a future.

These trends have become serious endeavours worldwide, **an example is UK developments in RE**- As at 21/01/2012, the UK has put in place about 511 total RE installations, generating from both, on and offshore, a total Capacity of 9,875.1416 MW from projects, from Wind, Wave, Solar PV, CHP, Biomass, Hydro, Waste and Others.

In this context, future work should consider how the policy framework can foster these investments and incentivise demand-side management in Nigeria at Federal and local levels and at regional levels, like ECOWAS West Africa Power Pool (WAPP).

8.1.2 Subsidies management in fossil fuel

Worst of all, fossil fuels attract a big economic drain, a burden of the world governments, as they subsidise fossil fuels by an estimated over $500 to $700 billion a year.[4] Economic theory indicates that the optimal policy would be to remove coal mining and burning subsidies, gas subsidies and replace them with optimal taxes. Global studies indicate that even without introducing taxes, subsidy and trade barrier removal at a sectoral level would improve efficiency and reduce environmental damage.

The key sources of Subsidy in Nigeria's energy value chain:

Similarly Nigeria has built-in subsidies in natural gas supplies pricing structure and downstream gas utilisation tax policies, to the extent that for those who have upstream operations, they can charge all gas development cost to the Oil revenues, which effectively reduces Petroleum Profit Taxes that would be paid to the government. In Nigeria, removal of these subsidies will include proper evaluation and impact of removal from activities in the energy related sector;

1. Gas Flare penalties and FDP procedures: The former, low flare penalties (N10/MCF) allows gas flaring to be sustained as it is cheaper to flare than invest in gas utilization project and this situation is further aided by procedures of approval for Field Development Plans (FDP) by the Department of Petroleum Resources (DPR), requiring oil companies to submit gas development programmes, after the fact not before the approval of the FDP; and the Minister's discretion to issue certificates to permit gas flaring. Addressing these would substantially reduce GHG emissions and increase investments and recover loss opportunity in gas revenues of estimated $200 million annually;

2. Gas Pricing: natural gas price setting has been discretionary and opaque and NOT tied to changing market environments- there is no structured and clear basis for setting tariffs and wholesale prices; e.g.
   - the gas supply prices to the NLNG;
   - the 1979 sale of 20% NNPC/government asset divestment or equity in the NNPC/Shell/Agip/Elf joint venture took no account of the natural gas stocks, it was regarded that gas was uneconomic and sold at zero price in order to stimulate investments into the NLNG (what an irony!); and
   - the gas supply prices to NGLs of Mobil and Chevron's GTL projects.

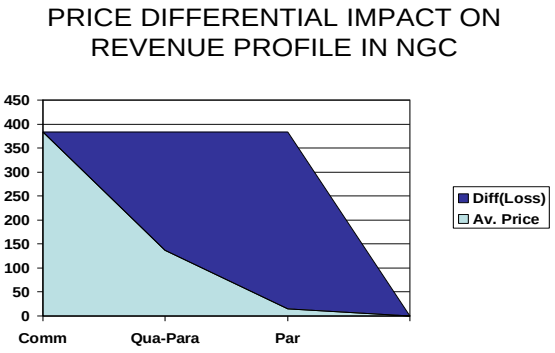
   These prices are below the costs of supply. This has resulted in million dollars annual subsidy by the government.

2.b Domestic gas prices to FGN parastatal -PHCN;- The PHCN pays very low prices for gas supplied to the thermal plants, to the tune of estimated $50-$90 million annual subsidy; this is a disincentive to investment in gas gathering infrastructure;

3. Non-payment of electricity bills by public sector institutions to PHCN and in turn PHCN debts to NNPC for supply of gas, results to millions in Naira in indebtedness-The

[4] ScienceDaily.com (Apr. 22, 2010) "Fossil-Fuel Subsidies Hurting Global Environment, Security, Study Finds"

Minister of Petroleum Resources, said to the senate committee on Gas that on the issue of low gas utilization as a source of domestic fuel in the country, Dieziani Allison-Madueke blamed the heavy indebtedness of the Power Holding Company of Nigeria (PHCN) for the situation. She said "I think the indebtedness of PHCN was somewhere to the tune of N9billion (or $58 million at current exchange rate) at this point in time"[5]; the chart shows supply price differential from the gas transport company of NNPC, the Nigerian Gas Company Limited (NGC) to Commercial, quasi-parastatals and government parastatal entities (with PHCN-creating losses to NGC, with the largest gas supply to it).



4. Gas Fiscal structure: the Government is actually paying for the gas utilization projects in Nigeria by this 'tax shadow system'; it allows oil producing companies to write off gas utilsation costs to oil revenues. The amendment of this laws will stimulate economic growth by diversification of players (investors) and increase collectable taxes in petroleum profit tax- as a consequence, PPT does not reflect the recent crude price increases in the market;

5. Oil products subsidy costs; The removal of this subsidy will bring about re-alignment of market forces that will encourage a competitive investment in the sector and reduce government deficit, in 2011 alone, direct subsidy on petroleum motor spirit (PMS) will be reduced by approximately two trillion Naira (N2 Trillion or $12.6 billion); and

6. The Power Consumer Assistance Fund (PCAF), section S.83 of the Electric Power Sector Reform Act (EPSRA), 2005 mandates some subsidies on electricity tariff rates for the consumer segment; the 'poorest of poor' under the Multi Year Tariff Order (MYTO) that cost about sixty billion Naira (or $385 million) annually[6] and more recently, the chairman of NERC, Dr. Sam Amadi disclosed that N50bn had already been included in the 2012 budget to subsidise power for those who could not afford to pay[7].

8.1.3 Current Electricity (Power) situation:

Electricity is essential for production of goods and services, which determines social and economic development. Nigeria's story is like most of Africa, excluding South and North Africa, has chronic power problems which are taking a heavy toll on economic growth and productivity. In power

[5] Daily Trust, 18 October 2011
[6] Daily Trust, 13 February 2012
[7] Punch, May 11, 2012

supply, Nigeria lags behind Ghana, Egypt, Algeria and also other comparable large countries like Malaysia, Indonesia and Brazil.

Similarly, the region's generation capacity is woefully inadequate, leading to limited electrification, low power consumption, unreliable services and high costs. Additionally, as much as one quarter of existing capacity is unavailable because of aging plant and poor maintenance. The *widespread reliance on expensive oil-based generation* makes the average cost of producing power in Africa extremely high. Many African enterprises experience frequent outages and in many countries backup generators, adding to the venting of GHGs.

Africa's electricity data includes:

- The total installed capacity in Africa was about 106.3 GW from which sub-Saharan Africa (SSA), 48 countries accounts 68 GW (63%) – no more than Spain's. [8]
- The total population of the continent was estimated at 917.8 Million, from which SSA Accounts for 747.3 Million (81%)[9].
- The total annual electricity consumption for Africa was estimated at about 488,315 GWh from which SSA accounts 325,950 GWh (66.7%);
- Per capita electricity consumption in SSA (excluding South Africa) averages only 124 kilowatt-hours a year, barely 1% of the consumption typical in high-income countries;
- Total consumption of electricity per habitant per annum for Africa 532 kWh/habitant/year;
    - North Africa 952 kWh/habitant/year,
    - West Africa 155 kWh/habitant/year,
    - Central Africa 151 kWh/habitant/year,
    - East Africa 65 kWh/habitant/year,
    - Southern Africa 1,767 kWh/habitant/year.

- Generation capacities of SSA are less than 200MW, well below the minimum efficiency scale, which means they pay a heavy penalty: costs reach US$0.25 per KW, twice the level in the regions of larger power systems.

- One of the cardinal objectives of the present Administration is to make Nigeria one of the top 20 economies in the world by the year 2020 and to support this ideal, power supply must rise to about 60,000MW by 2020 from current installed capacity of 6,000 MW, which generates about a daily average of less than 4,000 MW.

- According to PHCN action plan, it will achieve this through;
    - Rehab/Overhaul of existing assets;
    - Completion of power stations under construction;
    - Streamlining NIPP Implementation;
    - Adopting policy measures for domestic gas utilization /resolving larger Niger Delta Issues;

[8] ICA data 2012
[9] The UPDEA (Union of Producer, Transporters and Distributors of Electricity in Africa) 2006 data

- Securitization scheme-support being offered by the World Bank (WB);
- A well-articulated action plan with timelines;
- Attracting private investment; and
- Diversification of energy sources-coal, renewable, hydro.

➢ A recommended 175,000-192,000 MW (or 200, 000 MW in short) estimate is Nigeria's TARGET by the industry, aimed at sustaining the achievement of the MDGs, by 2030.

All efforts in increasing the access of electricity to population are useless without adequate related measures to increase the power production that can satisfy the demand.[10] It is at these cross-roads that Nigeria currently stands.

8.1.4 Why Green Economy?

It is recommended that whilst addressing these power infrastructure needs, there is a need to transform the reliance on conventional sources, oil and gas and to integrate green sources of energy so that the nation avoids the associated growth pitfalls of the advanced nations of venting CO2 through injecting/replacing with Renewable Energy (RE) sources.

Key objectives for transition from "fossil fuel to green fuel"

Nigeria like most developing countries is currently more a victim of emissions from the advanced economies, but needs to employ climate change adaptation strategies for the following main reasons;

a) Studies of climate change show that if no action is taken to mitigate it, it would cost between 10%-15% of global GDP by 2050[11], SINCE IT IS ALREADY A THREAT TO SUSTAINBLE ECONOMIC GROWTH, with impacts already felt on Agricultural production, food prices and security, migration, desert encroachment, flooding, conflict generation etc;

b) To prevent the nation from being a major contributor to emissions as it transforms the economy into one of the top 20 economies of the world, to start with;

c) There exists a large gap between energy supply- electricity supply and demand that ought to facilitate the immediate deployment of renewable energy options;

d) The fast declining non-renewable natural resources reserves base of crude oil and natural gas, leaves an effective (based on actual recoverable oil) **reserves-to-production ratio** (R/P) of *approximately 15-20 years for crude oil and about 74 years for natural gas, implies* a longer term planning outlook starting with at least 100 years, that caters for future generations;

[10] The Infrastructure Consortium for Africa (ICA) Annual Meeting, 13-14 March 2008
[11] Studies on Climate Change Economics by Sir Nicholas Stern

e) It upholds international conventions, the new global standards under the Kyoto protocol/the United Nations Framework Convention on Climate Change (UNFCCC);

f) RE is scalable and can have greater penetration into rural areas - e.g. Micro-hydro configured into village-scale or LGA/county-scale mini-grids. According to REN21 reports, there are more than 30 million households that get lighting and cooking from biogas made in household-scale digesters. An estimated 3 million households get power from small solar PV systems. Biomass cookstoves are used by 40 percent of the world's population[12];

g) Provides a long term "sustainable" green economy since Renewable Energy is sustainable in its production ability; the available supply of RE will not be diminished for the foreseeable future – in millions or billions of years; hence the use of the term "the green deal" for Nigeria; and

h) Renewable energy technologies (RET) offer prospects for a dynamic industrial policy. The deployment of RET in rural areas in developing countries offers opportunities for the use of local natural resources, for employment, and ultimately for institutional capacity.

To achieve these objectives, now requires a complete paradigm shift in the way the nations' natural resource has been harnessed and the recommendations to enhance revenue management that can be a source of funding the green economy.

RE Technologies:

Advances in low carbon energy technology and energy efficiency are the backbone of low carbon development and low carbon economy, which Nigeria ought to employ. This is well supported by traditional practices, as traditionally for example, farmers relied on making campus by themselves, as the use of chemical fertiliser has proven to be a source of land destruction if not managed well; and meat was generally roasted under the sun over a period of several days.

Development and implementation of the Strategic Energy Technology plan, requiring investments in R&D are needed. R&D demonstration and early deployment of technologies, such as various forms of low carbon energy sources, carbon capture and storage, smart grids and hybrid and electric vehicle technology, are of paramount importance to ensure their cost-effective and large-scale penetration later on. In addition, increasing resource efficiency through, for instance, waste recycling, better waste management and behavioural change, as well as enhancing the resilience of ecosystems, can play an important role.

Funding RE:

[12] Renewable Energy Policy Network for the 21st century (REN21)

It is recognized that funding will be required to support a green economy and it is our considered opinion that the elimination of currents waste, inefficiencies in the management of natural resources can help to support a green economy, starting first with the government relinquishing the role an "investor" and contributing annual budgetary funds (cashcalls) for upstream oil and gas projects under the joint venture and for NNPC capital projects.

Funding RE should be private sector driven and at the official launching ceremony of the Bank of Indsutry (BOI)[13] and the first (1st) renewable energy investment forum, the Managing Director (Ms. Evelyn Oputa) in an effort to effort to feature Nigeria in global renewable energy investment portfolio, through private sector involvement, stated that the total investments in renewable energy in Africa rose from $750 million in 2004 to $3.6 billion in 2011, that investment in renewable energy across the globe is increasing significantly from $33 billion in 2004 to $211 billion as of June this year, 2011. She explained that in Nigeria, investments in renewable energy have a large potential for growth given the large gap between energy demand and supply. That most of the renewable energy projects embarked upon in the country have been more from the government agencies at federal, states or local government levels.

RE funding mechanisms

Funding sources for Re will be from;

1. Private sector investors & Debt Financing (Banks ; multilateral lenders etc);
2. Institutional investors;
3. Government RE Bond Funds based on subsidy removal from gas, oil products and electricity; and
4. Under the UN Treaty, the Kyoto Protocol offers parties an additional means of meeting the cleaner targets by way of three market-based mechanisms, which are:

    a) Emissions trading – known as "the carbon market";
    b) Clean Development mechanism (CDM)-whereby developed countries invest in sustainable projects in developing countries to get carbon credits; and
    c) Joint implementation (JI).

These mechanisms help stimulate green investment and help Parties meet their emission targets in a cost-effective way. Nigeria is yet to exploit these new markets effectively and believe that an industry re-structuring can achieve this.

Sample of private investor in RE

[13] United Nations Development Programme (UNDP) partnership on "Access to Renewable Energy Programme" , on 16th June, 2011 at Abuja

The fast pace to which countries and private companies are switching to green economies is encouraging pointer to a greener world. For example, GE's investment in Renewable Energy includes investing in wind, solar, biomass, hydro and geothermal power assets and has invested over $6 billion in a diverse portfolio of renewable energy assets. In Serpa, Portugal, is GE's investment in the world's largest solar photovoltaic power with a project that cost $75,000,000; is an 11MW solar power plant on 150 acres, comprising 52,000 photovoltaic modules; and with no fuel cost or emissions, the Serpa solar installation will produce electricity sufficient to power 8,000 homes and save more than 30,000 tons a year in greenhouse gas emissions compared with equivalent fossil fuel generation, will remain productive farmland in one of Europe's sunniest areas[14].

Approach to Green Economy

It is our recommendation to start with, that green policies on technologies and application need to be guided under the newly re-created and integrated Ministry of Energy (MOE) with an Agency to be named as the Nigeria Federal Energy Commission (NFERC). In the MOE, Renewable energy can find a home. The key strategy is to ensure a harmonisation, a holistic approach to total energy management and governance as well as tailoring towards more green technologies into increasing the nations' electricity supply other than from conventional sources, oil and gas products and combustible waste (wood burning).

The strategic approach recommended for an overall Energy Plan

This is simple but the targets must be adhered to by all and by any succeeding government, for success by the following steps.

a. First address institutional and policy re-alignments to project the ultimate aim of building capacity and government to stop investing directly through budget allocation in oil and gas sector;
b. The Gas Master plan outlines the harnessing of dispersed associated gas and for the rehabilitation of existing gas supply infrastructure in the short, medium and long term and should be followed; and
c. Integrate green sources of energy.

The deepening of green economy will eventually constitute the major source of energy supply such that by 2030 (in 18 years) in order to satisfy the full Millennium Development Growth (MDG) growth targets, green sources of energy shall reach a minimum of 60%, this is the point to which energy supply adequately meets economic needs, a national growth requirement of estimated

[14] GE Financial services report, April 2006

200,000 MW electricity from the current grid capacity of 6,000 MW. This is a longer-term view and is still in line with the current Vision 2020 (in 8 years) target of 60,000 MW. In this regard the timing profile of the RE is to be aligned with the depletion rate of expected petroleum reserves-to-production ratio (R/P) of known discovered proven oil and gas resources.

8.1.5 Energy poverty and green economy

Nigeria and in Sub-Sahara Africa (SSA) the access rate to electricity is in general very low: 3%-40% (excluding South Africa), with electrification rates in;

- North Africa (including Mauritania) are 27% to 99%;
- West Africa 4% to 40%;
- Central Africa 3% to 35%;
- East Africa 5% to 25%;
- Southern Africa 7% to 70%.

It is attributed to the absence of an adequate electrification rates in Africa policy and weak commitment of governments to allocate sufficient means for increasing the access to electricity have been major causes of low output.

Power sector investment needs

Addressing Africa's chronic power problems will require major investment in the refurbishment and expansion of power infrastructure. The total spending needs of the power sector amount to US$40.6 billion a year, or 6.4% of the region's GDP. Existing spending on the power sector is US$11.6 billion, just over one-quarter of what is required. Existing spending represents 1.8% of regional GDP, although in the non-fragile low-income countries, this share increases to 2.9% of GDP.

Existing resources would go further if the sector operated more efficiently. Addressing the operating inefficiencies of the power utilities could reduce the funding gap by US$3.3 billion a year, improving cost recovery would bring an additional US$2.2 billion a year, and US$0.3 billion a year could be recouped by improving execution of the capital budget.

Even if all these inefficiencies could be eliminated, a sizable power sector financing gap of $23 billion a year would remain. Three-quarters of this financing gap is a shortfall in capital expenditure, while the remaining quarter is a shortfall in operation and maintenance spending.[15]

Commitments to the energy sector, by region

With an increase in 2009 of 75% compared to 2008, the energy sector has experienced the largest rise in commitments by ICA members, receiving US$6.3 billion. This is mainly due to a vast

[15] *(Source: AICD)*

increase in expenditure in South Africa - seven times higher than in 2008. Half of the total contribution, US$3.7 billion, to the energy sector was directed to South Africa in 2009. West Africa showed a sizeable increase too, with a tripling of commitments between 2008 and 2009, to US$1.6 billion.

AfDB and the World Bank are traditionally the most significant financiers to the energy sector, with their respective commitments of US$3.6 billion - of which US$2.8 billion was committed to South Africa – and US$1.8 billion in 2009. Together, these account for 85% of total ICA commitments to the sector.

Opportunities:

Sub-Saharan Africa is well endowed with both hydropower and thermal resources – but only a small fraction of its power generation potential has been developed - E.G. 61% of the region's hydropower potential is in just two countries – the Democratic Republic of Congo and Ethiopia.

Pooling energy resources through regional power trade promises to reduce power costs - the cost of producing power in Africa is exceptionally high and rising. The Southern, West, East, and Central African Power Pools - regional trade could reduce the annual costs of power system operation and development by US$2 billion per year - about 5% of total power system costs. Founded in 2000, the West African Power Pool (WAPP) is a cooperation agreement between nineteen national electricity companies in Western Africa under the auspices of the Economic Community of West African States (ECOWAS).

- Countries involved: Benin, Burkina Faso, Cote D'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo.

- Base load 31.3 terra-watt-hours meeting 70% of demand (2005)

- Current means of power generation: thermal 64%, hydro 31%, imports/others 5%

- Demand expected to triple in next decade requiring 18,000MW of additional installed capacity and associated transmission.

- WAPP is working with World Bank and other financiers to develop workable models for cross-border project finance and regulation on priority projects, along with ways to increase capacity of institutions responsible to support delivery.

- Other efforts of WAPP are geared towards:
  - **Increase investments needed for power grid expansion in the region;**
  - **Create an attractive environment for investments** in order to facilitate the funding of power generation and transmission facilities, including creating a common operating standard, rules and a transparent and reliable mechanism for the swift settlement of power trade transactions; and
  - **Formalise official and extended collaboration** in the region to expand power generation, transmission and trade.

Nigeria's power situation:

At the opening of year 2012, power supply stood at 3,881 MW, it was published that the government has failed to meet the 5,000 megawatts (MW) electricity power generation promised, hinged on reforms in the sector on the National Independent Power Projects (NIPPs) as well as the full privatization and commercialization of the generation and distribution companies, the eleven (11) /or the eighteen (18) successor companies to be created out of the Power Holding Company of Nigeria (PHCN) to private sector core investors.

Where are we today?

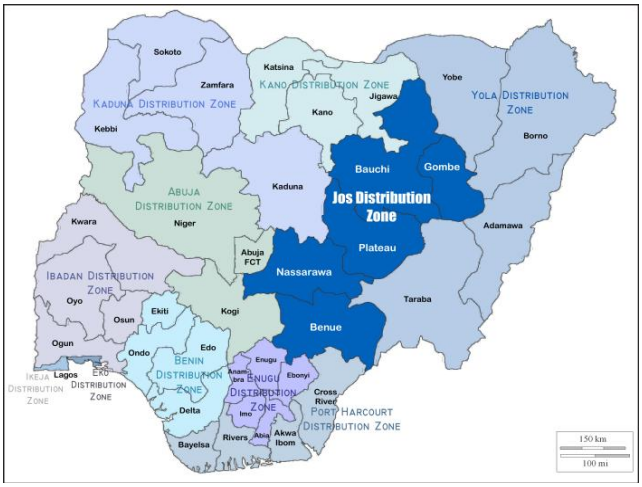
Country	Power Gen. (MW)	Population (Million)
UAE	4,740	4
Malaysia	24,000	25
Saudi Arabia	39,000	28
Iran	44,000	65
Indonesia	46,000	234
South Africa	46,000	44
South Korea	74,000	49
UK	82,000	61
USA	990,000	301
Nigeria	6,000 (installed)	150

PHCN (formerly the National Electric Power Authority – (NEPA) had been the state-owned agency responsible for generating, transmitting and distributing electricity for the entire country of Nigeria. As part of the on-going power sector reform efforts by the Federal Government of Nigeria (FGN), much of state-owned interest in the electricity services industry is being divested through a sale of a minimum of 51% of its equity to qualified long-term investors. This is based on the Road map for the Power Sector Reform inaugurated by President Goodluck Jonathan on August 20, 2010.

In support of which the National Electricity Regulatory Commission (NERC) is currently in the process of implementing the sector transition toward a fair and cost-reflective tariff regime through the revision of the Multi-Year Tariff Order (MYTO). In addition, credit enhancement packages are to be provided to the sector by FGN.

As it stands, the National Grid Capacity of about 6000MW is built around gas, oil and hydro in the ratio 37/32/31. The national energy consumption, according to the International Energy Agency (IEA), in 2008, was 4.4 Quadrillion Btu (111,000 kilotons of oil equivalent) and was derived;

a) 81.3% (percent) from combustible renewables and waste- use of biomass for off-grid heating and cooking needs;
b) 10.1% from oil products;
c) 8.2% from Natural Gas; and
d) 0.4% from Hydro.

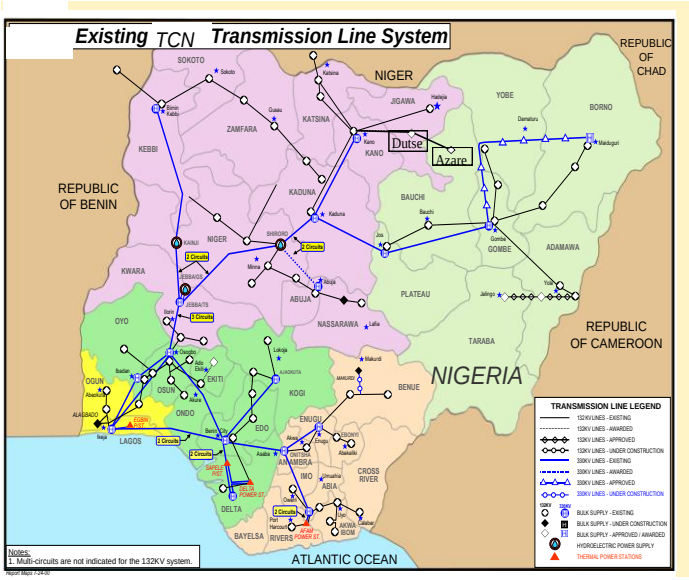


Nigeria stands out among nations with very high energy poverty (only about 50% of population, out of 158.8 million (CBN 2010 report) has access to electricity; and "per capita electricity consumption in Nigeria is closer to 70 kilowatt-hours per annum. This translates to an average availability of 8 Watts per capita - less than a regular light bulb - for each Nigerian citizen!".[16]

[16] IEA Director, 2005

The attendant problem with this is the destruction of her forest (another valuable natural resource), is used as a source of fuel, this further worsens this case. On a relative scale, the data below, Table 3, obtained in early 2009 indicates that three years after, in spite of spending some controversial $15 billion by the last administration, no progress has been attained in improving power supply.

Nigeria still requires huge oil and gas infrastructure to meet her domestic energy needs and to penetrate energy supply across the country; it is estimated by industry that required investment can be over $50 billion in both upstream and downstream sectors infrastructure for additional gas gathering, pipelines and processing facilities with a similar amount needed for generation, distribution of electricity. This spending requirement of over $100 billion required is very unlikely to happen as the net export revenue (nominal) earned by Nigeria in year 2010 was $65 Billion (OPEC) which does not satisfy the annual national budgetary requirement and debt service and has in the last five years has been consistently run a deficit budget.



National electricity requirement & Recommended Strategy:

Our recommendation is centred on concreting a re-structuring of the energy sector, to match the sector into privitisation; attract private investment; diversify sources of energy; and upper most re-jig the policies and governance structures.

The thrust of our recommendation in this paper focuses on the strategies that will support the optimum requirements established by industry and the Government for an efficient electricity industry to support `Power for all by 2020' at a target of 60,000 MW and recommended 175,000-192,000 MW (or 200, 000 MW in short) estimates in the industry to sustain the achievement of the MDGs, by 2030. A more recent report states that it is hoped that the privatisation of PHCN will greatly improve service and output, with the government targeting 18,000MW output by 2016. It is our informed judgement that based on the history of power development this target is more attainable.

Lack of access to electricity has been considered a major impediment to the growth and development of economies, especially rural. Most of the rural communities lack electricity as shown by the figure, the grid line system of Transmission Company of Nigeria (TCN) and that is even when the new lines under construction are added.

Similarly the rural communities have the highest level of unemployment, in ratio to urban locations.

The use of renewable alternatives may in the long term, be more sustainable and efficient system to penetrate energy supply instead of the pipe dream of providing electricity to majority through conventional infrastructure that will deliver gas that will eventually be exhaustible from depletion.

Challenges of current electricity plans:

First challenge is the low level of investments to supply electricity; only justifies the need to encourage a green economy that is more sustainable, even if expensive. The NIPPs power programme lack of scale of economy in reference to global power plants best practices and sizing, will generate a total of 1,588MW only from, these 7 projects - Gbarian, Bayelsa State (225MW); Ihovbor, Edo State (451MW); Omoku, Rivers State (230MW); Sapele, Delta State (451MW); Egbema, Imo state (338MW); Calabar, Cross Rivers State (561 (MW); Thom, Akwa Ibom State (188MW).

Secondly, the limited penetration of electricity supply was to be addressed by the creation of the Rural Electrification Authority (REA). Between years 1999 to 2007 it is reported that 836 rural electrifications projects had been completed, with 1,946 on-going. Furthermore, N45.8 Billion awarded for rural electrification to 662 Local Governments in 2007. Subsequent administration of Yar'adua dismantled this institution because of the high level of corruption, e.g. some members of the national assembly committee in charge of oversight functions were given contracts without any performance. Till date none of the accused has been booked for the crimes.

Thirdly, the lack of gas availability to domestic power is a serious problem since oil companies under the joint venture operating agreements have over committed gas to export projects for LNG, NGLs and to WAPCO. The Minister of Petroleum in providing details on gas utilization to the Senate committee on Gas in the country, the Minister said 15 percent of the gas is flared, 12 percent used for domestic consumption, 41 percent for export and 32 percent is reintegrated into the operation of the oil and gas sector[17].
No administration so far has had the moral courage to review this poor work programme planning and to change the tide that holds the country hostage without light, as they have several export LNG plants and other projects on the offing. The Minister of Power addressed this issue as contributing to PHCN's inability to meet the 2010 target of 5,000 MW, in a recent press release in January 2012.

Fourthly, low tariff rates and internal domestic debts on the power chain has discouraged credible investors in the past. The comparative study of tariff rates in West Africa placed Nigeria as having the lowest; at USA 0.08 cents/KWh.[18] A further comparison with recent progress made on the MYTO with the 2011 rates places the highest tariff rate for residential

[17] Daily Trust, October 18, 2011
[18] Comparative study of electricity tariffs used in Africa – December 2009 by Union of Producers, Transporters and Distributors of Electric Power in Africa (UPDEA)

category R5, at N15.6/KWh or $0.10/KWh at current exchange rate[19]. The Federal Government says the higher "cost-reflective tariffs" for residential and commercial electricity customers are necessary to ensure that investors can turn a profit. Under the new pricing regime, due to become effective in April 2012, tariffs will rise between 25 percent and 88 percent, though most customer classes will see a 50 per cent hike in their bills, from the present N10 to N18.80k for the low class consumers and about 23 naira/kWh for biggest consumers of electricity – wealthy individuals and businesses . The government has made provision for a N50 billion subsidy this year 2012, allowing the tariff for the poorest customers to be fixed at N3.30K.

The new tariff was calculated to reflect the real cost of supplying electricity, with a return of investment factored in, according to the Nigerian Electricity Regulatory Commission (NERC). This is near the average price in Africa, and is still less than half the cost of self-generated power in Nigeria.

WEST AFRICA - COMPARATIVE TARIFF(cents US / kWh)

		CIE (COTE D'IVOIRE)	CEET (TOGO)	SONABEL (BURKINA FASO)	EDM (MALI)	NIGELEC (NIGER)	SENELEC (SENEGAL)	PHCN (NIGERIA)	SBEE (BENIN)	VRA (GHANA)	NAWEC (GAMBIA)	LEC (LIBERIA)	EGS (GHANA)	EDG (GUINEA)
Social tariff (E=100kWh/month)	1kW	6,51	13,50	20,10	15,96	11,23	17,58	1,05	14,40	8,07	12,57	34,00	6,27	8,70
Single phase domestic usage (E=200kWh/month)	2kW	18,80	13,55	23,41	19,79	11,23	17,74	3,12	14,93	7,80	15,03	34,00	6,27	8,70
	4kW	20,60	14,00	26,93	19,79	11,23	20,47	3,12	14,93	7,80	15,03	34,00	6,27	8,70
Triphase domestic usage (E=600kWh/month)	6kW	16,51	15,55	25,48	29,57	11,23	17,74	3,04	16,34	10,32	16,68	34,00	8,61	8,70
	10kW	17,74	15,85	27,23	29,57	11,23	19,56	3,04	16,34	10,32	16,68	34,00	8,61	8,70
Commercial usage (E=1 800kWh/month)	12kW	18,74	17,91	24,71	30,57	13,40	23,52	6,45	16,00	14,61	24,17	34,00	14,61	12,40
	15kW	19,10	18,36	25,30	30,57	13,54	24,91	6,45	16,00	14,61	24,17	34,00	14,61	12,40
Semi-Industrial & motive power (E=2 500kWh/month)	20kW	18,89	18,40	24,95	23,19	13,52	24,63	6,44	16,00	13,22	24,17	34,00	13,22	12,40
	25kW	19,33	18,95	24,95	23,19	13,68	25,31	6,44	16,00	13,22	24,17	34,00	13,22	12,40
Medium voltage (E=35 000kWh/month)	250kW	16,37	14,92	24,62	19,37	8,27	20,09	7,95	15,15	14,06	27,33	34,00	14,06	12,40

15 Comparative study of electricity tariffs used in Africa – December 2009

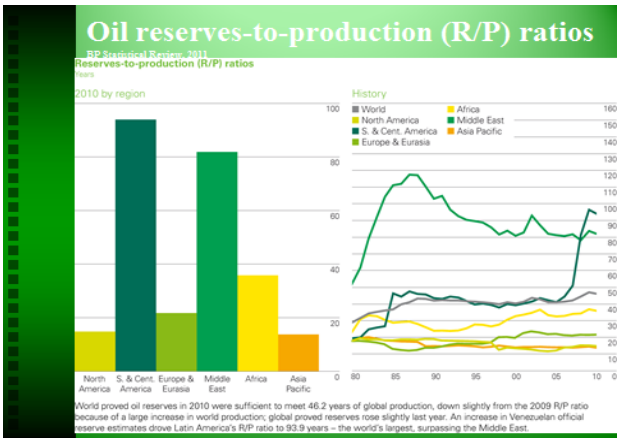
[19] Installed capacity of a Power Plant is measured in MW and 1GW=1,000MW and Power consumption is measured in time period, in the kilowatt-hour (symbolized kWh), where 1 GWh = 1,000 MWh = 10^6 kWh and 1 kWh = 3,412.1416 Btu

2011 Electricity Tariff Schedule-NERC

Tariff Code Details	Year starting 1 July				2011
Tariff Code	Fixed N/Month	Meter N/Month	Minimum N/Month	Demand N/KVA	Energy N/KWh
Residential					
Residential R1	50	250	50	0.00	2.2
Residential R2	75	250	75	0.00	7.3
Residential R3	300	1,251	300	0.00	11.0
Residential R4	300	4,003	12,509	0.00	15.6
Residential R5	0	5,504	78,178	0.00	15.6
Commercial					
Commercial C1	204	227	204	0.00	11.1
Commercial C2	272	1,134	272	0.00	14.5
Commercial C3	544	3,629	11,340	391.05	14.5
Commercial C4	0	4,990	70,874	425.05	14.5
Industrial					
Industrial D1	201	223	201	0.00	11.7
Industrial D2	268	1,116	268	0.00	15.2
Industrial D3	536	3,570	11,157	412.31	15.2
Industrial D4	0	4,909	69,733	448.16	15.2
Industrial D5	0	4,909	3,347,191	484.01	15.2
Special					
Special A1	120	500	120	0.00	11.2
Special A2	240	1,600	5,000	0.00	11.2
Special A3	0	2,200	31,250	0.00	11.2
Special A4	0	2,200	31,250	0.00	11.2
Street Lighting					
Street Lighting S1	0	940	451	0.00	8.6

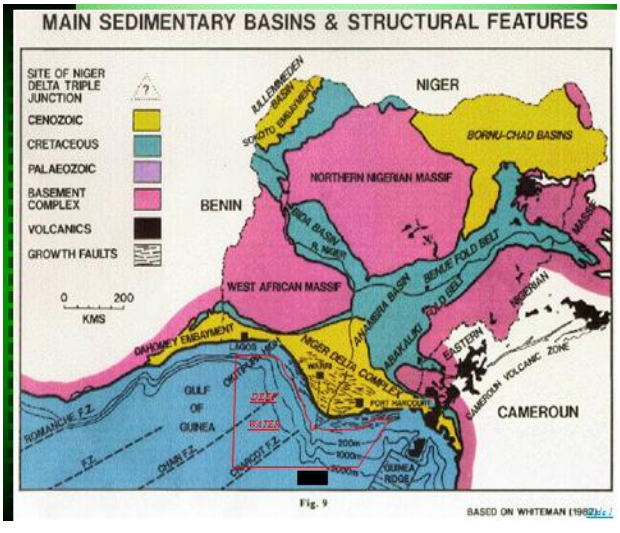
8.2 Management of natural resources (Crude oil and Natural Gas)

Nigeria is endowed with adequate fossil resources, with current 37 billion Barrels of proven Reserves of crude oil and 187 trillion cubic Feet (TCF) for gas, according to 2011 IEA report. In addition Nigeria has large deposits of bitumen (Tar Sands), indicated at 42 billion barrels- outdoing existing reserves of petroleum and low sulfur coal of nearly 600 Billion tonnes of proven reserves. This shows that Nigeria has adequate fossil reserves.



The whole ownership and control of all mineral rights in Nigeria are vested in the State (the Federation) according to the 1999 Constitution as well as subsisting Petroleum Act (No.51), 1969, the Nigerian Minerals and Mining Act, 2007 and the Land Use Act, 1978.

The prevailing petroleum State policy is that, through licensing it permits for the exploration, production of petroleum resources under the Petroleum Act of 1969, whether it is by a foreign or indigenous entity. The State also reserves the right to participate in any licensed block and to determine the type of contractual arrangements to or between members of allotted blocks. Based on the geology of the country seven basins are identified, namely; Anambra, Benue, Benin, Bida, Bornu (Chad), Niger Delta and Sokoto basins, where active petroleum can take place, with the Niger Delta having been the most active with aggressive exploration and production having taken place from first oil in 1958 and activities said to be reaching maturity. The deep water blocks still hold some additional reserve prospects because of the late history (licenses issued in 1993), though awards were in 1991. Oil and mostly gas wells have been established in the Anambra basin, gas shows in Chad basin, but nothing compared to Niger Delta yet due to low exploration activities and a lack of clear commitment.



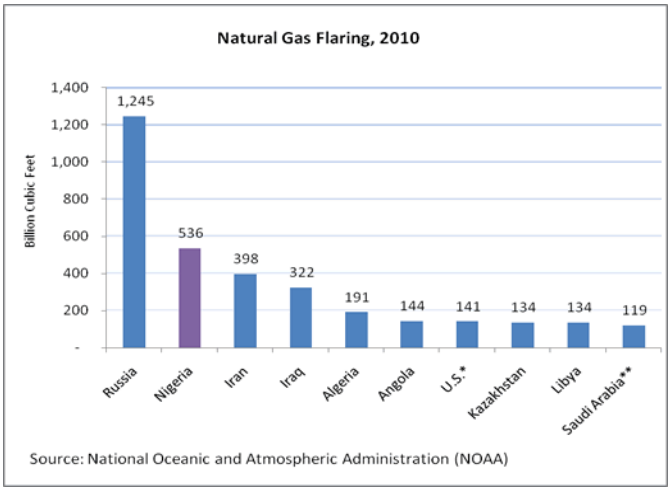
However, it is noted that hydrocarbon natural resource is a depleting resource. The **reserves-to-production ratio** (RPR or R/P) is the remaining amount of a non-renewable resource, expressed in years and at current consumption rate, commonly applicable to fossil fuels, particularly petroleum (crude oil and natural gas). Nigeria's R/P ratio

based on some published[20] data indicates about 45.6 years for crude oil proven reserves using year 2008 of 36 billion barrels. With respects to natural gas, the r/p ratio is 236 years, based on proven reserves report of 2008 (175 TCF)[21]. However, *from a technical stand point, only an average of 30-40% (thereabout depending on natural characteristics of the crude, reservoir conditions & other factors), of these reserves are recoverable under current technology, giving an effective r/p of approximately 15 years for crude oil and about 74 years for natural gas, respectively.*[22]

According to the reports by BP Statistical Review on reserves added in last 10 years between year 2000 and 2010 indicates only about 10 billion Barrels of proven reserves was from Africa, as the world's majority of additions came from South and Central America adding over 90 billion Barrels. This indicates, perhaps some maturing terrain from Nigeria (that holds the largest reserve in Africa) and even some of the reserves are from significant additions from new discoveries from new territories, like Ghana, Sierra Leon, Angola, Cameroon, Cote D'ivoire and substantial gas from East Africa's Mozambique. Similarly, the report indicates Africa's declining R/P, is below 40 years.

Nigeria is the 3rd largest exporter of crude oil, though ranks number 20 in production. There exist an over reliance to export of crude oil and natural gas for immediate revenue to run the countries' annual budget needs, over and above domestic needs and supply of adequate energy for sustainable development. A major portion of crude oil produced, out of an annual average 2.2 million barrels per day (mbd), over 80% is exported.

Nigeria is the ninth largest gas producer in the world and a major potential gas supplier and similar to crude oil the major portion of gas produced are for export - to LNG, NGL and gas supply projects to West African countries. The proven gas reserves, consisting of about 50 per cent associated gas (AG) and 50 per cent non-associated gas (NAG), and of the AG produced along with crude oil barrels, a substantial portion, about a third of gross natural gas produced is vented in the air and not harnessed for domestic gas projects to electricity and other uses, with 536 Billion cubic feet (bcf) of natural gas flared in 2010[23] alone, the second largest venter after Russia, mainly the AG accounted for a loss of income (the NNPC claimed that flaring cost Nigeria US $2.5 billion per year in lost revenue) but it also vents carbon dioxide that has destroyed the



20 BP Statistical Energy Review, 2011
21 Energy for sustainability: technology, planning, policy By John Randolph, Gilbert M. Masters

22 Subject to further verification.
23 Report by the National Oceanic and Atmospheric Administration (NOAA).

habitat/environment. Approximately only about 12% of the gas produced is re-injected into the wells, mainly for reservoir enhancement. The reasons for sustained gas flaring are discussed in later sections. All the export gas when they were planned, the Shell NLNG, the Mobil and Chevron NGL projects in particular, failed to provide for transfer of the wet gas for LPG production; for LPG to be supplied to Nigerian market, and only recently various efforts are being made and some marginal supplies are now being supplied into Nigerian markets. LPG is still largely imported, and the price has been deregulated as far back as year 2007. The government of Nigeria has been working to end natural gas flaring for several years but the deadline to implement the policies and fine oil companies has been repeatedly been postponed with the most recent deadline being December 2012, which appears unlikely to be met. In 2009, the Nigerian government developed a Gas Master Plan that promotes new gas-fired power plants to help reduce gas flaring and to provide the much-needed electricity generation; however, progress is still limited.

On 24 March 2011, President Goodluck Jonathan launched the Gas Revolution, intended to reposition Nigeria as a global industrial hub in line with the GMP. The plan is to attract US$ 25 billion in investments and create 500,000 jobs through a public-private partnership. Investors from Saudi Arabia, India, Italy and the USA, as well as Nigeria, have signed on to the plan. The gas industrialisation agenda goes beyond current gas-to-power initiatives by establishing a central processing facility in Oviakwu, Rivers State, a mega petrochemical plant and two fertilizer plants in Lagos and Delta States. Taken together, the gas-to-power and industrial projects would support the elimination of gas flaring in Nigeria as the markets thus created would have the potential to use all currently flared gas.

Petroleum (Oil & Gas) provides the annual revenue of an average of $60-$70 billion depending on market oil price and accounts for over 90 per cent of the nation's total export earnings. In year 2010, the net export revenue (nominal) earned by Nigeria was $65 Billion (OPEC sources), although the Standard & Poor's ratings agency pointed out that crude exports accounted for 72 percent of current account receipts in 2010.

Unfortunately, crude oil and gas has a low GDP contribution, though it generates majority export earnings, as it is a highly technologically driven (capital intensive) industry sector that employs limited manpower. According to records submitted at 2009 PIB hearing the oil companies directly employ 20,000 staff with several hundred as "contract staff"; and NNPC has approximately slightly below 10,000 on its list of direct employees (Jan 2012).

Also the local input materials and equipment used in exploration and production and for the petrochemical downstream sector are not produced in-country-there exists a low **local content** input, about 5% in goods and services (though the Local Content Regulator may claim higher rates). Indeed under table1, under Nigeria's Economy- the CBN data shows that the oil sector added negative growth between the periods of 2005-2007, which implies no or minimal domestic manufacturing input to the oil sector, especially in oil product refining.

Even this minimal Oil sector GDP growth in prices or revenue earned, has been fuelled mainly by the increase in global market prices which started around year 2000 due the quantum growth of other economies, mainly China and India. China has become very active in Africa, seeking access to natural resources, essential for rapid growth. In contrast, Nigeria is endowed with all kinds of natural resources but is unable to translate it into usable form, into secondary and tertiary production.

8.2.0 Harmonising Energy Legislation

The Petroleum Industry Bill, 2009/2010 is touted as the panacea of solution of the unwieldy aspects of the sector. The PIB is yet to be passed as an Act till date but it attempts to revise "the legal, fiscal and regulatory framework- the institutions and authorities for the Nigerian petroleum industry, and to establish guidelines for the operation of the upstream, midstream and downstream sectors"[24]. The bill has been largely delayed in passage due to conflicting partisan interest about some aspects of its contents, mainly on;

a. fiscal re-distribution of the economic rent, with oil companies opposing an increase in taxes and government perceiving the need to increase taxes to reflect changes of environment in a high oil price regime;
b. increase community share of incomes by the increase of some 10% revenue to oil communities (besides the existing minimum of 13% Derivation and 3% of oil budget that funds the Niger Delta Development Commission (NDDC); and
c) to increase and retain some of unwieldy institutions (such as PPRA and PEF), that have no proper place in a deregulated market driven downstream industry.

A bill that is yet to be passed into law has inherent weaknesses and may not address the grimness of the industry. In the Bill is embed the Petroleum Profit Tax Act (PPTA) of 1958 as part of PIB shows the lack of recognition that oil and gas products are mere commodities, though special and the taxation policy, management, revisions constitute part of the treasury functions of the Ministry of Finance/Federal Internal Revenue Service (FIRS). It is our opinion that the PPTA should be amended apart from the duties of the Minister which are under the Petroleum Act, 1969, as its 'gross summary' in the PIB even threatens the administrative details of tax management.
It is unheard of and it is not the practice that taxation is and is written by the operators of the petroleum industry by themselves for themselves!, which has facilitated the under-cutting games and one of the reasons for the years of abuse and the non-transparency surrounding revenue management in this sector. Nigerian Extractive Industry Transparency Initiative (NEITI) already challenged the Government not to pass the PIB 2009 as the "give-away" of revenues by 'corruptible' members of our society, that have succeeded in reducing the government revenues by millions of dollars. Government stands to have further erosion of revenues from the current poor state and we applaud the current FGN effort to revise the 2009 PIB under new committees.

8.2.1 The role of Government as an "investor" or "regulator?"

[24] Draft PIB, 2009

As discussed earlier, the role of government is regulatory and to create suitable investment climate. At the moment the government pays joint ventures cash calls to fund the upstream sector joint ventures budgets and provides budgets to the NNPC's capital investments and major operation expenses; by so doing it acts as an "investor". This has fostered inefficiencies, corruption and wanton mismanagement of resources of the country. It is hard that an investor can regulate itself! As a consequence, many multiplier negative impacts arise from this situation, such as;

8.2.1.0 Inability to supervise and Audit the petroleum sector effectively;

8.2.1.1 Poor Financial policy systems used in the sector; a system of paying majority of JVC cashcall in USD which began (illegally, violating the nations accounting policy) in about 1985 by a simple instruction by the Federal Ministry of Finance (FMF); and payment of contractors in foreign currency by a simple letter issued by the Ministry of Petroleum in 1993; thus depleting national foreign reserves, creating a sub–currency market and adding pressure on the value of the Nigerian Naira.

8.2.1.2 Low level of Operatorship status by NNPC/Government resulting to lack of control over Work Program, Budgeting and Performance, set by the Joint Operating Agreement (JOA) and the PSC management Committee procedures and therefore these programmes focus on export of petroleum other than to domestic markets; and

8.2.1.3 Political and partisan interest that dictates the selection, nomination of key management positions thus accelerating poor governance.

8.2.2 Management of Upstream sector- Licensing System and Government role

On aggregate, over 80% of crude oil & natural gas assets, production operations/management are held under foreign interest, mainly through the joint interest participation share equity, the risk production sharing contracts (PSCs) with the international oil companies (IOCs), as NNPC/Government stands by as non-Operator, though holding an aggregate of 57% participating Equity share in the JV companies and 20-30% 'Profil Oil' in the PSC arrangements. Similarly, Independent operators cede major share equity crude to Technical Partners for lack of access to finance, largely. Indigenous production capacity therefore stands at about 5-7% of the total 2.2 mbpd. The indigenous participation remains low and a far cry and wish that it can contribute heavily to the domestic economy. So far, much more serious attention has been paid to oil producing than to the production of natural gas in Nigeria, even though Nigeria is more a gas province.

8.2.3 Natural Gas & unabated Gas Flaring

The law under Associated Gas Re-injection Amendment Decree No. 7 of 1985 (Penalty for Gas Flaring) provides charges for flaring aimed at stopping gas flaring. This decree (now an Act) was introduced at a charge of two Nigerian kobo per thousand standard cubic feet (2k/MSCF) of gas

flared at the fields where authority to flare associated gas was not granted. At the point in time the penalty was equivalent to US 4 cents/mscf based on the value of Nigerian Naira exchange rate and the prices of crude prices were in the range of US $20-$28/bbl. The penalty for gas flaring was increased to 50 kobo/mscf in 1992 and lastly in the 1998 and 1999 national Government Budget pronouncement, the penalty was increased N10/mscf. In view of the then value of Naira, which essentially, at current exchange rate of N156/$, is less than a cent, only $0.064. Interestingly, this penalty is only applicable to the Operator, even where government has contributed cash calls to the operation, indirectly has contributed to the flares.

The issues pertaining to flaring of gas includes;

i. Lack of policy to ensure that all AG produced with oil must either go into a gas utilization plant or be re-injected at the stage of work programme approval, the approval of Field Development Plan (FDP) are given by the DPR;
ii. Lack of domestic infrastructure to connect to users/industry and lack of open access to pipelines to 3rd parties;
iii. Focus on export gas market;
iv. Lack of access by 3rd parties to large equity gas reserves (held by Government and joint venture companies);
v. Low domestic gas purchase prices; and
vi. Extremely low penalty rate for gas flares (N10/mscf or $0.064/mscf).

In summary, without a proactive intention to change the situation, the IOCs continue to sit on undeveloped gas assets due to lack of open access to 3rd parties, flare gas at such low penalty, export the gas they can market to long far off distant markets to the detriment of energy supply domestically. The Gas Master Plan has essentially had limited success because it is based on the premise that 3rd parties can buy gas from upstream suppliers. This is worsened by the low domestic gas supply price structure.

8.2.4 Gas Pricing

The lack of "correct" pricing of gas supply from the oil producing companies to various projects for export and those supplies by NNPC and Shell to the PHCN sector has permitted the citizens of the country to be held hostage without electricity as no investor can make a return on investment. This is in spite of the introduction of several fiscal gas incentives current (and historic). The prices for gas in Nigeria are extremely low by international standards. About 2004 the level of gas price was inappropriate for any return on investment to be attained, Prices to the electricity sector was 30 cents/MBTU compared to $7/MBTU Henry Hobbs at USA. This does not attract investment in the sector.

For example;

a. PHCN currently pays $0.12/mmbtu = c.$0.7/boe (c. 2% of current oil price (= c.$30/bbl));
b. The NLNG pays $0.5/mmbtu = c.$3.0/boe (c.10% of current oil price).[25]

[25] Source; NNPC- 2004 data: at current crude price the parity to oil prices is phenomenal!

A sector based pricing framework has been developed from about 2009 and there is increasing alignment to encourage domestic gas projects, especially to the power sector. Unfortunately, there seems to be no readily available gas (until gathered - The geological structure of oil and gas in Nigeria has accumulations that are scattered and require more investment to gather from the gas fields) as most have been committed to export projects, for LNG and NGLs. The low supply gas prices to the IOCs are more beneficial for export projects - a case of 'buy cheap and sell high'! It is imperative to see why IOCs will not permit 3rd party access to gas resources, to such comfort and FGN largesse.

8.2.5 Funding gas development

As long as the major source of funding for oil and gas comes from FGN, there will be limitations for gas development and a radical approach to funding should be addressed, first with government getting out of the sector as an investor.

8.3 Management of Nigeria's petroleum Downstream sector- oil products and need for subsidy reform and deregulation

The so called downstream sector processes crude oil and natural gas. It produces oil and petrochemical products and chemicals like petrol, diesel, kerosene, benzene, waxes, and ethylene, as well as gas products, such as methane for electricity production, NGL and LPG plants.

8.3.0 Oil Products downstream deregulation and Subsidy removal

The much talked about subsidy was finally removed in the New Year, 2012 as the price of petroleum motor spirit (PMS) went from N65 to N141 (or $0.90/liter), which is the same nominal level with the first petrol price increase in 1979! Under pressure from a sustained labour induced strike that lasted about a week, the price was adjusted to N97/liter (or $0.62/liter) on January 17, 2012.

Hitherto, the policy was to subsidise petrol to make it affordable to consumers, even when the 'landing price' has been about N140 per liter. PMS (or petrol) prices constitutes about 75% of all product mix with balance being Kerosene, Low Fuel Oil, diesel and LPG. The prices all, except PMS were already deregulated some years ago, around 2007. Subsidy is payments made by government to traders or NNPC for the difference between NNPC's Ex-Depot (sales point) price OR the Landing Cost of imported oil products in Nigeria based on a the Fixed Pricing Regime established by the Petroleum Products Pricing Regulatory Agency (PPPRA). PPPRA is responsible for fixing prices based on a pricing template (import parity prices plus mark ups for transportation, distribution, marketing and guaranteed margin).

Prior to 2001, subsidy was at two levels; crude price; and product price, because sales of the crude to domestic refineries was at a fixed price of $9.50, and from January–December 2002 a fixed price of $18/bbl was applied, all the sales were converted into Naira and transferred to CBN Federation Account. The NNPC since 2003 has been paying international prices for crude oil since Government allowed her to lift the total 445,000 domestic share to refineries, which they sell the excess un-refined portion in the international market. NNPC uses the revenues made on the sales to import products as well as appoints 3rd party traders-whose landing price is at international higher prices. These incomes generated by NNPC from sales of domestic crude is insufficient to meet the import cost hence in about year 2005, the Revenue Mobilisation, Fiscal Allocation Commission (RMFAC) insisted on the structured system and budgeting for subsidy to increase transparency and an account called the PSF (Petroleum Support Fund) was created under the Federal Ministry of Finance (FMF) that pays the differentials after information on importers are gathered by NNPC and PPRA.
These processes had alleged corruptible practices of round-tripping (re-circling/re-submitting port papers); inflating prices of the PMS by changing port of discharge; bribing PPRA officials to inflate the template of calculation of value of landing prices etc. In a committee investigative report set up by government, it is said that in 2007 the Nigerian Custom Services (NCS) showed

that about 700 cargoes docked the ports of Nigeria and yet NNPC submitted a record of 1,200 cargoes for subsidy payments and no punitive measures were taken.

But the Government estimates to bridge the gap of the cost of importation in 2012 with was N1.2 Trillion Naira (or $8 billion @ N150/$). This represents one third of the annual national budget.

In addition, the relative low level of Nigeria's petrol price of $65 (or $0.42/liter) compared to say Niger Republic at about $1.2/liter, accounted for excessive leakages and illegal cross border trade, to the extent that the current consumption daily average of about 35 million liters is questionable. This new revision of domestic PMS prices to about $0.90/liter at N156/$, and with the reduction to about $0.62, makes the current pricing more competitive. Comparative costs of other domestic price of PMS/liter in year 2008 are shown on the data, Table 1, below[26]:

Table 1.

Comparative cost of domestic price of PMS/liter in the sum region (source, FMF, OPEC, 2008 data):

Country /$ per Liter	
Cameroon	1.13
Chad	1.25
Niger	1.12
Benin	0.93
Nigeria	*0.44*
U.K	1.76
Germany	1.40
Italy	1.48
France	1.80
Japan	1.08
USA	1.77
Canada	0.96

The current prices puts Nigeria PMS as the lowest compared to surrounding countries, Benin Republic, Cameroon, Benin and Niger. Smuggling will continue until there is a full deregulation when a better aligned, more transparent sub-regional market will emerge.

It is clear that Government also wanted to reduce deficit budgets, but it is touted that the International Monetary Fund (IMF) is behind the scheme of subsidy removal, and has urged countries across West and Central Africa to cut fuel subsidies, which they say are not effective in directly aiding the poor, but do promote corruption and smuggling. According to Reuters, the past months have seen governments in Nigeria, Guinea, Cameroon and Chad moving to cut state subsidies on fuel. That Ghana spent about $279 million dollars in subsidies in 2010 and has recently, on the 29th December 2011 made adjustment to prices of petroleum products and PMS is now equivalent to N184.972 (or $1.18 /liter) in line with this agenda.

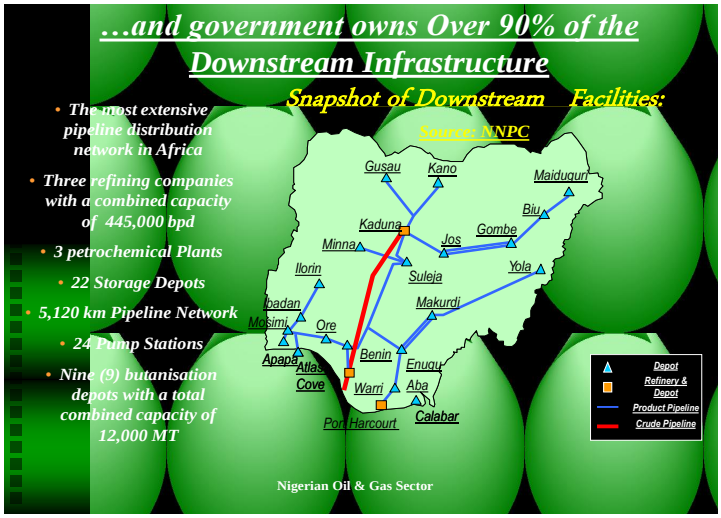
8.3.1 Calamities of subsidy; lack of deregulation and poor downstream policies

i. Massive imports:

[26] Source, FMF and OPEC 2008 data

Large imports are required to meet consumption needs (current demand estimates are said to be about 35 million liters of PMS, 22 Million liters of AGO, 18 million liters of DPK per day). However over 90% of PMS consumed is imported, with local refineries have averaged 10% of local demand sometimes and in the last decade averaged 30-40%. A proper wider cost-benefit analysis associated with subsidy would reveal costs or wastages that are beyond the annual $8 billion which is cash paid in subsidy for imported products that only relates to primary cost of product, transport, port charges and margin. The wider costs not estimated in value in this report, include:

a. Demurrage
b. Administration/Personnel involved in logistics from the various organisations- Customs, NPA, NMA, NNPC, PPPRA, NDLEA, SSS, Nigerian Navy etc.
c. Bank charges on issuance of Letters of Credit (LC), loans, VAT etc.
d. Loss of Productivity down-time (plant-Refineries, depots, pipelines etc); and Cost of personnel not utilized-and associated overheads/promotions! within the owned plants
e. Cost of building import infrastructure- additional terminals, jetties (by private and NNPC) and private marketers storage depots that now litter Lagos, Port Harcourt and Warri ports; Atlas Cove was converted by NNPC from an export oil facility to an import facility at over $500 million by increasing storage tanks and loading arms;



f. Cost of capital tie-down, existing distribution facilities lay fallow-depots, pipelines with tankers plying and damaging roads etc;
g. Cost of environmental degradation, pollution and HSE;
h. Loss of Government taxes from industry as even duties are lowered for imported products and from numerous citizens involved in these transactions that are unaccounted for;
i. Cost of domestic transport by road plus bridging (distribution) cost paid by Petroleum Equalisation Fund (PEF) as more tankers were acquired, leaving fallow existing oil infrastructure;
j. Cost of productivity loss time by consumers due to occasional scarcity-queuing at petrol stations;
k. Cost of added security;
l. Cost of wastages-leakages on the chain;
m. Cost of disruption of the linkage industries-transport, agriculture, education (schools), manufacturing that are dependent on petroleum products;
n. Cost of associated unhappiness, depression to Nigerians;

o. Cost of deaths due to loss of lives on Nigerian roads due to too many trucks plying the roads;
p. Cost of repairs/replacement of destroyed/damaged road network;
q. Cost of premiums due to insurance on risk to business and on individuals involved;
r. Cost of Noise pollution; etc.

ii. Low Refining Capacity:

Over the past two (2) decades, local refineries have functioned at an average 30-40% of capacity and less;

a. Operational Performance in year 2000-2007- for the 4 refineries were;
   - Port Harcourt Refining Company (PHRC) (old and new), 47%;
   - Warri Refinery & Petrochemical Company (WRPC), 29%; and
   - Kaduna Refinery & Petrochemical Company (KRPC), 25%;
b. Three (3) petrochemical plants at battery plant location and associated 5,120km of crude/product pipelines, 25 Jetties, 22 Products Depots, 24 Booster Stations and 1 single Point Mooring Terminal were hardly functional; It was recently reported sometimes in 2010 by the media that NNPC pumped products, for the first time in 10years to Kano depot!
c. The occasional plant operation start-ups constitute additional drain to resources from a technical/economic point of view-as fixed cost in operations remains the same;

iii. Poor Maintenance Culture:

Lack of maintaining the Mandatory Turn-Around Maintenance (TAM) schedules - NNPC's corporate policy is to carry out TAM on its refineries at twenty-four (24) months intervals (or every 2 years). The government has to also provide the budget for it as part of national budget. As such, in the last 15 years, no TAM has taken place:

a. PHRC TAM has been carried out three times (in 1992, 1994 & 2001), since it was commissioned in 1989;
b. WRPC' s TAM took place in 1994 and 2004; and
c. KRPC 2011 and recently completed in 2012.

iv. Low Levels of Authorisation to incur Expenditure:

There exists limited authority to incur expenditure - The Limit of Authority (LOA) of the NNPC Group Executive Committee (GEC) was established in line with Federal Government statutes, at N50 million in 1989 (about $420,000 today) and Subsidiaries/Directorate Management Committees at N5 million (or $4,200) but increase to $2 million by the last administration of Yar'adua. These sum does not permit quick or emergency responses to operational exigencies common in oil and gas industry plants, and contribute to frequent shut downs.

v. Long decision making process/turn around completion of contracts:

This low level LOA and AFE processes further impacts on emergency equipment's, which inherently are expensive high technology items creates too long to put in place any contract in the NNPC, an average of 1-2 years, and in worst cases up to or beyond five (5) years!

vi. Substandard products:

Reported occasional incidences of deaths caused by toxic fuels over time since mid-1990s continue where quality control and too much trans-shipment, unlicensed non-professional processors of crude and traders participate in the market place. There is talk that traders still dump sub-standard products in Nigeria with relative impunity.

Recent media reports in 2010 states that over 100 ad-hoc refineries were recently discovered and shut down in the Niger Delta region alone.

vi. High cost structure on the import logistic chain & unused tie-down capital:

Tight offloading capacity at NIPCO's private (the Independent marketer's) facility and at NNPC's Atlas Cove that have limited capacities relative a large number of awaiting vessels to discharge, results to high demurrage from offloading – it is reported that about N113billion ($942 Million @N120/$) demurrage cost was incurred by NNPC in year 2008 alone. In addition, there are other costs associated to storage at various marketers' depots, transport via trucks and associated bridging cost paid and managed by the Petroleum Equalisation Fund (PEF)[27].

Furthermore, Capital tie-down (unused installed capacity) is at a cost. There are high operating variable costs of under- utilised manpower and associated cost-medicals, promotions & others.

vii. Lack of/Poor levels of Margin/Profit to Investors:

Low revenue to Investors and thereof there are either low or no taxes derived to the Federation. The example is the NNPC's subsidiary; PPMC has been reporting negative balance over the last decade and between years 2000-2007 made a cumulative loss of 22 Billion Naira.

viii. Over pricing of petroleum products:

[27] The PEF was established by the Act (decree) No 9. of 1975 and is currently a very vital and crucial parastatal of the Federal Ministry of Petroleum Resources. The organization is charged with the responsibility of reimbursing petroleum – marketing companies of any likely losses they incur due to sale of petroleum products at a uniform price throughout the country.

It is alleged that, in some cases sellers pay for products based on Rotterdam prices, but will charge Nigeria a higher price by discharging the products at a point where the price is higher, and then reload it, get a new bill of lading and certificate of origin reflecting the price at the second port. It is said that Cote D'Ivoire was used as one port for such malpractice.

A 19% guaranteed margin set by and is added to the PPPRA template to importing traders, reflects an uncompetitive and inefficient downstream sector, indeed it represents another fixed price mechanism that bears no relationship to market forces and opportunities exists for cost reduction.

ix. Inability to re-investment/expand the downstream sector:

There have been no additional refinery built since 1986 and associated plants due to monies being used as subsidy.

x. Mismanagement/corruption in the downstream sector:

The Report of the "Crude Oil Allocation, Products Import and Export by NNPC" set-up in September 2003 discovered that N17 Billion revenue was lost to the decision to sell Fuel Oil to four (4)companies at Domestic prices. Also several financial scandals in PPRA, PEF continue to be reported.

xi. Creation of poor market structures:

A non-competitive market thus brings about monopolies /oligopoly traders; the traders are a few and have been mainly the same companies in the last 10 years-few new entrants in recent years. Subsidy is convenient, only to the market barons.

xii. Destruction of linkage economic sectors dependent on products-

Transport, manufacturing, agriculture, education have suffered the vagracies of product availability.

xiii. Pressure on National Budget from unsustainable Subsidy Payments:

Subsidy had been rising to about N1.2 trillion ($8 Billion) expected in 2012.

xiv. Misapplication of Federation Revenue earned from crude oil sales:

Imports make upstream income to be spent on subsidies.

xv. Labour unrests & reduced employment:

Further worsening productivity capacity of a nation; and Locked-in employment potential from downstream industry and other dependent industrial sectors.

xvi. Fixed Price control disadvantages:

A disincentive to private investment - foreign and local investors; An inhibitor to a free market entry; Regional and sub-regional market price distortions leading to smuggling and leakages.

xvii. The rising number of raptures/incidences:

Increase vandalisation from less than 1000 rising to over 3,000 in the period 2003- 2006. It is hoped greatly, that the AMNESTY and environmental policies will stem these in the Niger Delta region.

8.3.2 Current dialogue on subsidy removal:

Conflicts with government has already have resulted from the subsidy removal, which has resulted an unprecedented massive strike in Nigeria's history and skirmishes that resulted to some death. Whilst the Government is pushing the position that subsidy is not sustainable and has not made any budgetary provision for it in the 2012 national budget. The Nigeria Labour Congress (NLC) and the Trade Union Congress (TUC) responses has been that government has shown consistently that it cannot be trusted considering how agreements and promises have been reneged upon in recent years. Specifically, labour complained that the Federal Government despite signing an agreement with it and issuing an enabling circular that the N18,000 minimum Wage will be implemented for Federal Public Servants from August 2011, implementation was yet to commence, it is reported on this, the President feigned ignorance an blamed internal slow processes of government departments. It concluded that failure or refusal by Government to implement agreements and massive corruption are amongst the reasons Nigerians do not fully trust government.

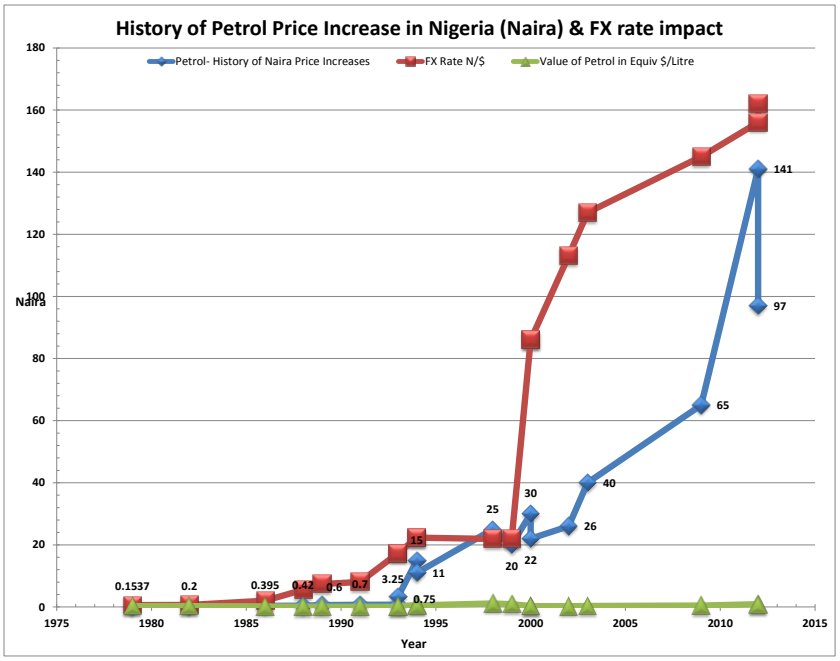
In this said meeting held on 20th Decemebr 2010, with Labour, the government presented a document on Subsidy Reinvestment and Empowerment Programme (SURE-P) under which it listed amongst other projects, the construction or completion of eight major roads and two bridges, provision of healthcare for 3million pregnant women, six railway projects, youth employment, mass transit, 19 irrigation projects, rural and urban water supply. In its response, the Labour Movement noted that out of the projected N1.134 trillion to be saved from the subsidy removal, the Local Government allocation is N202.23 billion, States N411.03 billion and the Federal Government N478.49 billion and concluded that even if the Federal Government alone were to spend the entire N1.134 trillion savings, it cannot execute even a fifth of the projects it had listed. Labour drew attention that the Presidency's presentation was simply a repetition of the presentations made by the Babangida, Abacha and the Obasanjo administration, and that none of those promises were kept. It pointed out that none of the presentations by the Presidency presented facts on the impact of oil subsidy removal on the populace particularly the informal economy where most Nigerians earn a living.

President General of Trade Congress Union (TUC), Comrade Peter Esele, viewed the latest development of subsidy removal as "a stab in the back" by the Federal Government who only in the last weeks of December 2010 entered into a dialogue with the organised labour in a bid to forestall a looming anarchy. He explained that the action of government was a total declaration of war on the "poor masses who are being punished by an inefficient system that is anchored on few corrupt oil thieves who are major sponsors and backers of government". The labour has vowed to shut down the government by embarking on strikes.

8.3.3 Recommended approach to alleviate pains of subsidy removal and sustain correct pricing of oil products

The two parties; government and the civil society must unite to experience harmony over the management of subsidy removal.

It is our considered opinion that the following steps need to be taken: That the government first must recognise macro-policy impact on the Nominal Value of Naira Vs Price of oil products. The exchange rate (FX) pre-1986 was stable, stronger than the US dollar, rising close to parity of N1/$0.89 by 1985. In 1986, the FX rate per USD, dramatically escalated with the introduction of Structural Adjustment Programme (SAP). This has been seen by Nigerians as the failed World Bank economic policies in 1986 and FX has recently nose-dived acerbated by recent economic and financial banking crises bringing Naira to its heels, depreciating to about N156/$ and over N160 at the parallel market. There is therefore a definite erosion of the economic value of the current N65 kobo per liter price of PMS, which is adding pressure on the "correct price" for petroleum products. The graph above shows alignment in 1998 only, when the exchange rate was N25/liter with FX rate at about N22/$, the price of PMS was equivalent to $1.14/liter, close to current regional rates. In general the price of PMS has been below $1/liter equivalent since the first price increase in 1979 (see chart).



It is our recommendation that a transparent index pricing mechanism should be used to avoid the constant engagements on pricing of oil products.

Furthermore, when will these erosions of the Naira value stop; to stop impacting on oil product pricing? That is when the pressures on Naira are minimized from reduction of; high cost of

government expenses at the 3-tier levels; wasteful financial policies and system (payment to contractors and cashcalls in Dollars and other foreign currencies, based on inadequate sometimes falsified currency splits; payments by government at the 3-tier levels for Christian and Muslim pilgrimages (about N1.5 billion spent in 2010 alone-the Executive Secretary to the Christian pilgrims board recently, on 15/1/12 said on AIT TV channel that the value of prayers for Nigeria are unquantifiable! In our opinion, hundreds of people barely have one meal a day to eat!; wasteful importation of foods (rice, sugar etc.), petroleum products and other luxury goods; estacode (per diem) allowances for overseas conferences and medical trips for the patient plus family; business and first class travellers on government accounts; vast number of aircraft fleet (about 10 planes) owned by the Presidency, NNPC and often deployed for non-business affairs like ex-Presidents, dignitaries (traditional chiefs and others); etc.

8.3.3.1 SHORT TERM Approach:

i. Tackle & punish corruption:

Government to continue building the confidence of her citizens by winning corruption that can support the drive to remove subsidy and to implement full de-regulation.

ii. Open-up trading/imports of petroleum products to others:

Firstly, any trader that has storage facilities (approved by DPR) can import petroleum products, thus further opening competition by breaking up PPPRA's or NNPC's "specially selected traders", who currently have import monopoly. The system shall continue to rely on DPR's regulation/Ministry of Environment/Testing Agencies, exerting effective oversight function on Quality and Control of downstream facilities and quality of products.

iii. Simplify market entry to new investors in the downstream:

Open access policies and sharing of assets for ownership/use of refineries, de-pots, pipelines, Jetties and other facilities (We do not need to await the enactment of the PIB).

iv. Establish viable transport systems and apply subsidy more directly to those impacted on:

Establish a public transport system across all the states of the federation at subsidised rates - thus giving subsidy directly. Federal Government to create the incentive system to States and Local Government that comply with the drive.

v. Create Fueling location of public transport separate from other individual users:

As done in more advanced countries public transport vehicles should fuel their vehicles at special fuel dumps and introduce cheaper fuels, like CNG and bio fuels for city transport.

vi. Manage macro-economic & fiscal stability and establish an index price system:

Interest rates, exchange rates have significant impact on pricing regimes for petroleum products. There is need to establish a indexing system to link petroleum pricing, utilities services, and labour salaries, such that when market factors change–a flexible mechanism is employed to remove market distortions arising from continuous market vagrancies. Global best practices exist applying this system.

vi. Re-structure the Downstream sector immediately; Role of PPPRA and PEF:

The origins of the two institutions are tied to the framework of the industry subsidy regime and a desire to maintain uniform price policy across the country. These organisations are further entrenched in the proposed the 2009 Petroleum Industry Bill (PIB); the Bill affirms these already enacted bodies, the establishment of the Petroleum Equalisation Fund (PEF) and The Petroleum Products Regulatory Authority (PPRA), renamed from Petroleum Products Pricing Regulatory Agency (PPPRA) and their respective Management Boards. In a deregulated petroleum sector, the existence of PEF is abnormal as market forces should determine distribution cost across the country and beyond, just like airlines, fixed telephone rates and simple domestic consumables, like 'gari', tomatoes and yams (do not have uniform prices in every location!). Similarly price control by PPRA will no longer be necessary, with many competitors in the market place, unlike the current monopolistic traders enjoying the largess of wide margins through fixed prices. If no measure is taken the continuing practice of manipulating the pricing template will be sustained because of reliance on imports.

There will be need to distribute the current staff of PEF/PPPRA to the industry, through a competitive internal application process and the FGN should note this in revising the PIB in 2012.

vii. Re-structure the NNPC Trading function and capitalise the NNPC or out-rightly privatise it:

NNPC as a commercial entity should have a proper fully fledged trading operation like other national oil companies such as Kuwait, Petrobras, Statoil etcetera, by participating directly in the market place, in the spot market places. Currently it appears NNPC only has a limited global trading operation through Nigermed, Napoil and Hyson, relying on brokers to handle their crude oil trade and appoints third parties to import products. NNPC needs urgently to be capitalised so that they have full control of its downstream cashflow and capital investments. NNPC sells crude at market prices and should sell their products similarly.

Immediate benefits:

a. Instant price drop as experienced during hands off by Government on price control regime of 'essential commodities' (suger, milk and rice) in the 1990s;

b. Reduction in corrupt practices – such as elimination of middlemen; and

c. NNPC will go and face her commercial business- to refine and compete with imports coming into Nigeria, since it can sell what it produces, charge the correct price and import any differential.

ix. NNPC to change Trading Policies on credit grace period and demurrage:

The NNPC should cut down the grant of 60 and 90 Days credit period to traders/offtakers on term contracts for domestic traders and crude oil traders, respectively. The current credit grace period appears so long and it simply means that NNPC is allowing her receivables to be unduly delayed to the benefit of her 3rd party traders i.e. in the 90 days grace period the companies are trading with Nigeria's monies, including Capital gains earned freely.

8.3.3.2 MEDIUM TERM:

x. **Cancel the system of Term Contracts for crude oil exports for domestication to processing plants for oil and gas:**

Priority be given to resource allocation for plant construction for domestication oil and gas based industries to stop the sale of primary products (crude oil and natural gas) to earn added value on the petroleum chain, employ many greater numbers of labour and release excess products for export markets. Based on which the resource base of Nigerian reserves; type of crude/gas; and location of reserves will form the basis of decision making;

Examples of past mistakes:

a. KRPC, the lube plant location in Kaduna in addition, no consideration was given for the cost of imported heavy crude!
b. There is no need to give 20 Refinery licenses (as done in year 2000) with-out carrying out in depth analysis, of which crude streams and which reserves will be dedicated to them.

8.3.3.3 LONG TERM:

xi. Concurrently put in place a rigorous and adequate Energy planning and linkage between upstream and downstream:

Without Research and Development (R&D), studies and feasibility projects taking place, home grown, there appears to be no adequate information on effective resource deployment and utilisation.

xii. Establish, on the exchange a commodity market for crude and petroleum products (and others) and encourage similar development in the sub-region.

xiii. Establish a strong statistical data &reporting of the Downstream & Upstream sector:

This helps to align information and access to activities of all the industry players. The State energy needs & plans with those by private companies are easily evaluated. A good example is the U.S. ENERGY INFORMATION ADMINISTRATION (EIA).

xiv. Invest in alternative energy uses:

Encourage and diversify energy sources to alternatives- solar, wind, biofuels to release products for the export market.

xv. Full deregulation of downstream sector:

Government in the long term should play the role of regulator and remove the heart of 'investor', as well as strengthen regulatory authorities.

xv. Need for full Industrialisation & creation of petroleum allied industry to support Oil & Gas infrastructure (backward integration):

As there exist vast numbers of automobile mechanic workshops to support vehicles and cars (whether imported or assembled locally), so is the need for industrial capacity and allied industries to support oil and gas infrastructure in fabrication of pipelines, tankfarms and platforms, supply of chemicals as examples. This will not only create jobs but will provide a quick turn-around for maintenance of equipment's, where spare parts and skills are readily available. This can only be achieved by;

a) Policy alignment and synergy;
b) Education; and
c) Investment in R & D.

A major part of the reasons for failures of Africa's industrial development is lack of ownership of technologies, finance, and organization amongst other issues such as corruption, share will/passion/guts and sustainability/stability of policy.

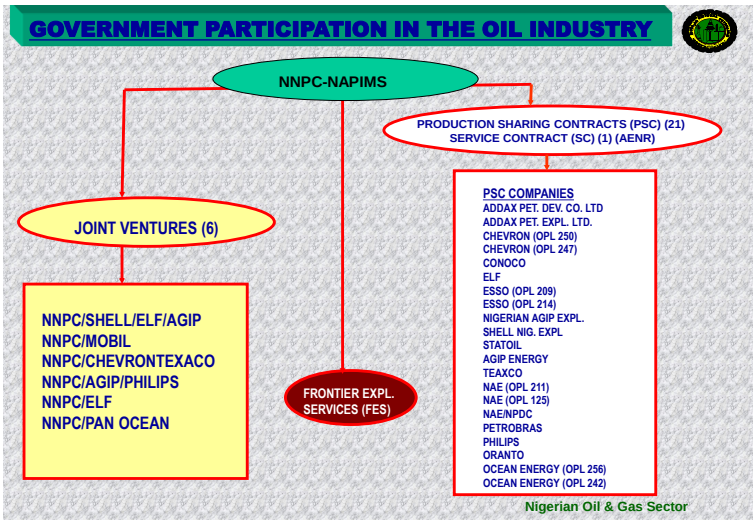
KEY BENEFITS OF SUBSIDY REMOVAL & DEREGULATION:

- Encourages private building of infrastructure e.g. New Depots, Refineries etc. which would tremendously improve supply
- Ensures adequate supply that eventually cause marketers to compete on service to the customer and other value-added products
- Ensures capital recovery by investors - PMS and HHK currently account for over 75% of petroleum products market and this benefit would come mostly from the pump price of these two products
- Prices will be primarily dictated by market forces
- Assures Investors and Government to earn profit and taxes, respectively
- Increased competition among marketers will eventually result in lower prices to the customer.

8.4 Revenue accounting and transparency

Taxes are the means to which Government earns revenue from industry and from her citizens/companies who engage in business operation, under the Petroleum Profit Tax Act (PPTA) of 1958 and the Company Income Tax Act (CITA) regulations. Taxation must be an efficient system for Economic Rent distribution, under normal transparent "market discipline". The aim is to distribute the gross income fairly to all stakeholders (investor and government) and also in a manner that does not discourage investment nor should it discourage investment in *other* sectors.

First of all, the activities of the oil industry are normally classified into Upstream and Downstream Sector.
The laws surrounding the fiscal regulations are similarly distinct between the two sectors.
The major taxes accruable to Government include:
Petroleum Profit Tax (PPT): – 85% of Taxable Income (for upstream operations) and 65.75% for first five years for 'New Comer'.
Company Income Tax (CITA): – 30% (current CITA rate) of Taxable profit (for downstream operations)
Royalty rates:
Onshore land = 20%;
Offshore shallow water= 18.5%;
16.67% = >200 meters (m) water depth
12% = Up to 500 m
8% = Up to 1,000 m
4% = Up to 1,000 m
0% = Beyond 1,000 m for Production Sharing Contracts (PSCs).
Royalty rates for natural gas suppliers (upstream): land 7% and offshore 5%.
Education tax:– 2% of Assessable Profit
NDDC Levy:-3% of capital expenditures (Capex) and operating expenditures (Opex) Budgets of upstream oil producing companies.



8.4 Revenues from the upstream petroleum sector

Revenue paid to the government Federation Account come from the following sources:

i. Gross crude sales of NNPC/Federation Equity share from the six joint venture companies (JVC) operations; and

ii. Government derives Taxes in form of Royalty and Petroleum Profit Tax (PPT) (see diagram), arising from the following operations:

a. The Joint Venture Companies (JVC) or international oil companies (IOCs) share of equity production-(6 companies producing JVC partners of NNPC are Shell, Mobil (Exxon/Mobil), Chevron/Texaco, Elf/Total, Agip & Panocean); and
b. Production Sharing Contracts (PSC) and Service Contract (SC) contracts with multinationals, e.g. Addax, Agip Energy Nigeria Resources (AENR), SNEPCO (about 22 companies);
c. Indigenous and /or Independent Sole Risk operators;
d. NNPC's direct operation by Nigerian Petroleum Development Company (NPDC);
e. Agips's NGL Supply to NNPC's Eleme Petrochemical Plant; and
f. Natural gas supply sales from the upstream producing companies to NNPC's NGC; to West African Gas pipeline Company (WAPCO) by NNPC, Shell and Chevron and to the LNG projects.

8.4.0 The major sources of government revenues are those of the following:

i. The aggregate of 57% equity share by government arising from the joint venture Participating Interest agreement (PIA) under joint operating agreements (JOA) with IOCs.

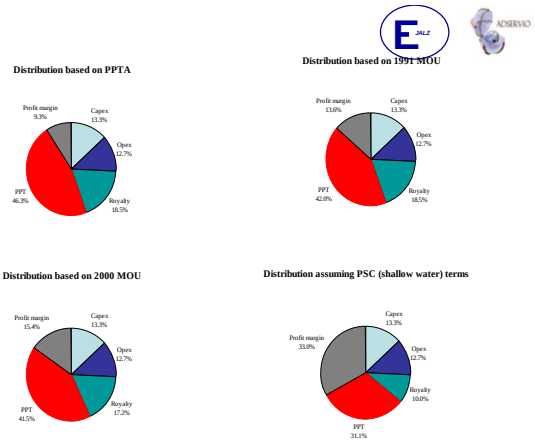
In this regard, because the upstream assets - petroleum Reserves are not vested in the Nigerian National Petroleum Corporation (NNPC), except those assets held direct by her NNPC and operated by her subsidiary the NPDC, the whole gross sales (which includes cost of business, tax elements and profit) of these crude and gas sales goes directly at the point of sale (POS) into the Federal Public Account (called the Federation Account (FC)) for redistribution to the 3-tiers of government. Thus NNPC, through its corporate Division called National Petroleum Investment Management Services (NAPIMS) only acts as an agent by the supervision of those upstream joint venture activities and operations. Hence the joint venture share of cash calls for work programmes execution by the nominated operators, the JVCs or IOCs are paid for by the FC as well as the NAPIMS overheads. Thus on this portion of crude oil and gas, about an aggregate of 57% in volumes, there is no tax accounting or profit allocation, the gross income goes into the FC.

ii. Crude Oil & Natural Gas under the joint operating agreement (JOA) taxation total production constitute over 90%:

The profits of petroleum operating companies (Upstream companies or the JVCs/IOCs) are taxed under the provision of the Petroleum Profit Tax Act (PPTA) of 1959 (as amended) and under the terms of a Memorandum of Understanding (MOU). The current Tax Rate in the PPTA is 85% vide Section 16(1). The MOU were first introduced in 1986, at a time of low crude prices regime ('oil doom') of less than $10/bbl, which created a reduction in capital investments, especially in new exploration. Thus the MOU created several incentives given in terms of deductions and providing higher margins to IOCs when their investments in capital cost increases (I will spare you the excruciating formulas relating to these deductions).

Historically, incentives to the PPT began about 1975 and the effective rate of 85% Tax Rate began to dwindle ever since then. The most significant change was introducing the MOU, resulting

to a reduction to Federal Government collectable taxes (PPT) and by 1991 the revised MOU had reduced PPT from 46% to 42%; and in 1991 from 42% to 41% in year 2000 MOU, on aggregate, going by a simple analysis. The oil price regime has since changed to current levels in the region of $100/bbl yet there still exists many levels of deductible items that run into Billions of USD (such as all gas development costs being charged to oil revenues). These are still being benefited (see item, iv below by producing companies with no one to put a stop to them, or as long as revisions of taxes remain on-going.



As a consequence of the multiple deductions, the effective tax rate are in the a range of 40-70%, depending on the company's levels of Technical Cost and Price of crude oil in the market place, as against the nominal rate under the PPTA of 85%. Oil producing companies often flash the 85% tax regime, deceptively without reference to multiple pre-tax rate deductions, misrepresenting/masking the true tax they pay in Nigeria, presenting Nigeria as one of the severest tax regimes in the world. It is our considered opinion that the delays in passing the PIB are strategic to ensure that IOCs continue to benefit untowardly and are presently creaming off all the windfall profits, especially under the PSC arrangements.

iii. Production Sharing Contracts (PSCs):

All of the fourteen (14) blocks awarded in 1991 to nine (9) IOCs were deepwater except Ashland's (or now known as Addax awarded in 1975) are shallow water blocks. Subsequently, those Contractors/Operators with deep water blocks convened under a section of the Lagos Chamber of Commerce & Industry, to form a body named, the Oil Producers Trade Group (OPTS), with a specific section named "Deepwater Operators".

The acreage blocks in deepwater and Benue trough were considered frontier areas and it was decided then, that the governing fiscal regimes under the Petroleum Profit Tax Act of 1959 would not give the Contractors a profitable basis to undertake exploration and production in a deep water terrain, beyond 1,000 meters of water depth. This was further impinged by developments in the global crude oil price regime during the period, with average crude prices at about $20 per barrel. Hence, a new set of fiscal structure, named the PSC Terms was put in place in 1993 for all those deepwater offshore blocks and the terms enacted under The Production Sharing Contract Act (PSCA) 9, 1999. These terms have recently become a subject of re-negotiation between Contractors and NNPC, during the first primary term of twenty (20) years (1999-2009) of the Oil Mining Licenses (OMLs). The inability to timely complete re-negotiation that revises the PSC terms to reflect current environmental changes such as crude prices hovering in the region of $100, implies an on-going huge loss of revenues to the government.

Subsequent PSC awards were made in year 2000 and 2008 bid rounds with different amended terms but still embedded with some weak economic terms, against the government, that does not

reflect common and normal economic instruments, like the PSC 50% Investment tax credit (ITC)[28] or Investment Tax allowances, which manipulates and reduces "Tax Oil" allocation to Government. For clarity, if a company expended $1 billion to develop a field, in Nigeria for fiscal purpose, can report it as $1.5 billion because of the 50% ITC.

iv. **Natural Gas**: or Gas Exploitation (Upstream Operations)

This involves all operations necessary to separate gas from the reservoir into usable form at utilisation or designated custody transfer points, either through pipelines or tankers. These fiscal incentives approved in 1991 under the Associated Gas Fiscal Arrangement, which were subsequently enacted into laws includes:

(a) all investment necessary to separate oil and gas from the reservoir into useable products is considered part of the oil field development;
(b) capital investment facilities to deliver associated gas in usable form at utilisation or designated custody transfer points, will be treated for fiscal purposes as part of the capital investment for oil development; and
(c) capital allowances, operating expenses and basis of assessment will be subjected to the provisions of PPT Act and fiscal incentives under the Memorandum of Understanding (MOU).

All these incentives have not elicited the desired effect as gas pricing, which is more reflective of market forces, remains the key to unlock this sector's potential. It is difficult to raise/increase investment in gas utilization projects based on fiscal incentives alone (as there is no certainty if these are sustainable or can be changed by subsequent governments) but based on market forces, with price of commodity being key.

8.4.1 Revenues from the downstream petroleum sector

The downstream sources of income to Federal Account in the Oil Industry includes taxation under the Company Income Tax Act (CITA), currently at 30%, and those I have named as "project specific terms" (SPT) that were awarded discretionarily to investors from the following:

i. NNPC's petroleum products sales, petrochemicals products sales and gas sales accounts (if any);
ii. Mobil's NGL plant (SPT);
iii. Chevron's LPG plant (SPT);
iv. Nigerian LNG plant (SPT);
v. Retail petroleum marketing companies Unipetrol, AP, Conoil, Texaco plus indigenous sellers etc; and
vi. Retail gas marketing companies like Shell Nigeria Gas Company Limited (SNG), Gaslink (now Oando) and Unipetrol (now AP)

8.4.1.1 Gas Utilisation Tax system (Downstream Operation)

Gas utilisation involves the marketing and distribution of gas for domestic and industrial uses. This would include power generation, Liquefied Natural Gas (LNG), household and factory

[28] ITC in economics reflects normal discount factor to compensate for first investment capital injected into a development capital project in this case. ITC (thefreedictionary.com) is a Tax incentive that permits companies or individuals to deduct a specified percentage of certain investment costs from their tax liability in addition to the normal allowances for depreciation, as it offers a percentage deduction at the time an asset is purchased or capital invested.

consumption. The incentives applicable for this purpose are under various amendments as Act 18 and Act 19, and include:

(a) companies engaged in gas utilisation as explained above, are to be subjected to provisions of Companies Income Tax Act, a current rate of 30%;

(b) an initial tax holiday for three years, renewable for an additional two years, will be granted to such enterprises subject to satisfactory performance of the enterprises. The tax relief period of the company is to commence on the production day of the company;

(c) accelerated capital allowances after a tax holiday are available as follows:

(i) Investment in plant and machinery; 90% annual allowance with 1% retention;

(ii) Additional Investment Allowance of 15%; and

(iii) The dividends distributed during tax holiday to investors in respect of investments in foreign currency or introduction of plant and machinery of not less than 30% of the equity of the company shall be free.

Amongst others, project specific terms (SPT)-special tax terms were designed for the NLNG, MOBIL'S NGL that includes Invest Tax Credit of 35% for the later.

8.4.2 Challenges of the Tax systems

In general, transparency issues in the management of petroleum revenue sector are accounted for, by:

i) Obsolete oil and gas/mining regulations that do not reflect changing environment;
ii) Lack of capacity/ineptitude by regulators to manage the process and dynamically make changes to tax laws as the environment of prices and cost of business changes;
iii) Market power;
iv) Corruption; and
v) Poor commercial structures in the petroleum sector.

The last, such as the NNPC does not enjoy commercial and financial autonomy unlike other national oil companies, like PDVSA, Statoil Hydro etc. Consequently there exist inadequate and quality annual returns/audit reports to evaluate her performances.
In greater details the problems are summarized below;

a). **Tax returns prepared by oil companies (Self-Assessments) are not challenged:**

To the extent that FIRS tends to rely wholly on what oil companies present to them as tax returns and lacks staff with in-depth knowledgeable of petroleum technical know-how to assess cost and track crude prices is extremely sad for this situation to fester since 1958, since first oil;

- **Lack of capacity & Skills**: the ability of a tax regulator to administer the correct and effective rate has become questionable giving rise to creation of bodies like, Nigerian Extractive Industries Transparency Initiative (NEITI) to mitigate a 'bad' situation;

- **Inability to pay competitive salaries:** The tax office has limited capacity to hire suitable personnel as government remunerations are far below industry and global rates, which further weakens tax administration;

- **EITI/NEITI intervention**: The government, the citizens have continued to question the returns and activities if IOCs, and indigenous oil producing companies in Nigeria - have been viewed with suspect over time.
  Similar developments and issues arising in other countries grew to promote the creation of a global coalition initiative called the Extractive Industries Transparency Initiative (EITI), a global movement aimed at ensuring that extractive resources aid sustainable development.
  Nigeria subscribed to it and was inaugurated in February 2004 and enacted into law in May 2007 the Nigeria Extractive Industries Transparency Initiative (NEITI) Act. It is mandated by law to promote transparency and accountability in the management of Nigeria's oil, gas and mining revenues. NEITI has commissioned the Financial, Physical and Process Audits of Nigeria's Petroleum Industry for the period 1999 to 2004. This was the first comprehensive audit of this strategic industry since Nigeria struck oil in 1956. Since then it has continued with this exercise with 2005 (?) audits currently under review with 2006-2008 audit completed though not yet in public domain. NEITI recently commissioned the audit of 2009-2010.
  Regardless, NEITI also is said to have limited capacity to fulfill her mission adequately and various civil societies and development agencies have been assisting to improve on it, as NEITI's activities is also a major component of the on-going anti-corruption reform in Nigeria.

b). **Licensing Rounds & Signature Bonus payments;** in spite of introducing some commercial process from year 2000 to 2007 license rounds, the system is still manipulative and the payment of bonuses lack transparency, some companies emerge with discounts and payments are made to all sorts of government accounts based on past investigations;

c). **Unknown national crude and natural gas Reserves:** There exists inadequate oil accounting of how many barrels of proven reserves exist and there also exists non-effective reservoir management know-how and studies that are evaluated independently by Nigeria on the reserves;

- About 2004 Shell discounted her reserve portfolio in Nigeria as a consequence of new compliance standards on the exchange in the USA; yet there was no independent data to confirm/challenge the basis by DPR/NNPC/FIRS in Nigeria.

d). **Irreconcilable daily crude and natural gas production:** How much oil are produced daily in Nigeria are irreconcilable; and there is no scada system or known technologies in flow control systems in crude oil transportation network (besides the metering points), that provides 'real-time' reporting from well-heads, which is a usual and common practice between partners; and the nation still relies on the casual ancient "dipping" technique to assess volumes in storage tanks at offshore loading terminals. All past attempts to install

those systems, even after contracts were put in place by NNPC have been thwarted by some operators and by officials of NNPC;

- **Royalty payments are on gross production basis;** It is difficult to agree that these revenues are not understated since the production figures are not certain.
- **Gross Production in the calculation of PPT returns;** suffers the same problem above stated.
- Accordingly, NEITI reports show that crude productions figures for the years 2006, 2007, and 2008 still being disputed, as Production and lifting data reported by the Department of Petroleum Resources (DPR), and other companies, including NNPC, and terminal operators (IOCs), were inconsistent and therefore could not be fully reconciled; and
- **There are alleged cases of 'bunkering'; oil theft** that is wide spread in the Niger Delta and perhaps at loading points of at least estimated over 100,000 per day lost, constituting about 5% of the country's production.

d) **Unwholesome multiple deductions before application of Tax Rate:** The tax system should be simplified to remove a myriad of complicated formulas; multiple deductions and a multiplicity of different types of taxes for each investor further worsens administration of taxation;

- It is said that the PIB has tried to achieve this but still questions are being asked about the excessive benefits in the proposed and revised PIB of 2009, which gives away excessive benefits to oil companies (who are said to have corruptly manipulated legislators and others), as reported variously, including by NEITI;

- Good examples;

i). Review the PSC terms that allows 50% Investment Tax Credit (ITC) or allowance. If a company spends $1 Billion dollars Capital expenditure for a deep water development-during calculation of "Cost Oil", it will calculate it as $1.5 Billion. This effectively reduces PPT or "Tax Oil" by the same amount. ITCs in economics represent compensation of capital tie-down.

ii) Eliminate the principle in the MOU that high capital investment should accrue a high guaranteed margin- this policy is misleading and does not account for wasteful and deliberately hiked-up capital expenditures that are common in the industry. The MOU must be abrogated all together and not by changes to oil price levels.

e) **Inability to change tax systems and benefit from windfall profits:** to be proactive, to revise tax levels when tenure period expires or changes in the environment occur;

f) **Allowing downstream gas cost to be charged to crude oil expenditure:** This system directly reduces earnings from PPT and also the performance of the two sectors becomes diluted that makes each sector performance assessment difficult; This system also does NOT encourage 3rd party investors nor offers them an even playing field, since they do not have component upstream crude oil operation in Nigeria, thus assisting to sustain gas flaring; and FGN is paying for those gas projects;

g) **Corruption by Tax officials:** Reported cases of under-hand deals;

h) **Lack of Will by Government:** The government lacks courage to do the right things in spite of experts that have oversight responsibilities;

i) **Discordant tunes and disjointed roles by oversight functionaries of government:** It refers to DPR, NNPC, FIRS, FMF and other security departments and officials at loading terminals, who all work independently and have little or no common data base that is IT driven that operates on the same platform;

j) **Too many taxes in Petroleum-The NDDC, Education levy** and sundry add to the burden of tax on operators; the former is three (3%) percentage of JV annual budget and simply implies that the 3% is tax deductible from PPT, i.e. the IOC's contribution is diluted into the budget and all those elements reduce the level of PPT; Thus the cost of running NDDC and the projects by implication form part of upstream cashcall budgets, which makes revenue transparency difficult; and proves FGN inability to truly identify and segregate cost centers against fiscal discipline;

k) **Revenue from NNPC's direct operation in NPDC, NGC, NLNG and issues of transfer pricing and revenues:** Currently these may be the only subsidiaries of NNPC that generate revenue but it is not clear how or whether these units pay tax as their revenues are diluted in the group accounts as dividends, which in total the group account should have negative books from common knowledge of her high center costs and making huge losses from the PPMC, that relies on subsidy and not market instruments for profitability;

l) **The poor management of the 57% investment costs and gross sales of crude oil and gas sales thereof by NNPC:** These constitute the direct income from government/federation investments from contributing cashcalls. NNPC lacks adequate capacity through her agency NAPIMS, to effectively check-mate the IOC joint venture partners; NAPIMS;

   i. Lacks technology base;
   ii. Lacks operating experienced staff to match IOCs who have staff with 20-40 years' experience, and many in the NNPC are trainee staff and acting in supervisory capacity;
   iii. Lacks adequate accounting and auditing system and furthermore there is no invoicing system in place. It is what the JV partners submit as

performance reports that is largely the "cost of business" (attempts to set-up any has been resisted internally within NNPC and pressures by IOCs);

iv. NAPIMS itself is a cost center and additional burden to 'costs'; it has today become a source of so much leakages for funding all 'federation related cost' that are not directly operational;
v. Staff selection have become highly politicked from within and outside;
vi. The status of NAPIMS as an 'agency' is not transparent and is not a 'best practice' arrangement, as the assets of oil and gas are not bestowed in NNPC as is the case with Petrobras, Statoil, etc., to lead to proper commercial structures and thus auditing;
vii. The parallel department of NAPIMS (or it's unit/department), though controlled at head office of NNPC, is the **Crude Oil Marketing Department (COMD**) that sells all the federation crude and gas (NGL)products:
    - COMD is not a Trading department by deduction from its title, it simply allocates crude and gas volumes to third party marketers and does not maximize sales incomes by participating directly in the market;
    - COMD sales terms are largely on FOB basis and makes little money from transportation- vessel charter rates, a component of crude oil trading; which is one of the biggest businesses in oil and gas;
    - COMD establishes the netback pricing system referred to as 'Realisable Prices (RP) used for PPT returns and 3rd party traders, which are fraught with manipulations as oil companies tend to pay much lower than 'spot prices' and the government loses money in tax and from her 3rd party traders sales prices paid directly to the FC;
    - The reported numerous 'conflict of interest' between some officials in COMD, traders, politicians and government officials go without saying from reported transparency and accountability investigations such as Abisoye panel, Justice Irikefe tribunal etc., all to no avail.

A weak tax system implies a loss of revenue to the coffers of government and in turn creates the incapacity for government to deliver social welfare and infrastructures as the estimation from above are unquantifiable losses and require urgent attention.

8.4.3 Recommendations on optimising Revenue from petroleum

i. A process guide/protocol is to be put in place as to how and when tax terms can be amended in order to reduce interferences by Operators-Oil companies and by the NNPC. They can and should make contributions but should be prevented from writing the petroleum tax policies of Nigeria as hitherto, too many amendments of fiscal terms have

been made by a casual letter, without enactment and due process. Most of it brought about as a result of pertinent interest and pressure from the oil companies that actually write the laws and use the officials of NNPC/DPR/FIRSas sponsors/surrogates/champions. Also the national assembly should be guided that fixing taxes is specialized and should rely on technical and economic experts to pass the relevant laws.

ii. Increase capacity of institutions responsible and develop specialized oil and gas skills in the tax office as well as use of credible consultants;

iii. Improve on remunerations of personnel at relevant institutions;

iv. Punish corrupt officials;

v. Review the tax proposals in the proposed PIB before passage and segregate it out of the PIB and simply take the corrections/changes to the existing PPTA, for continuity and audit trail;

vi. Aggregate all taxes to a single tax rate according to their respective product lines- crude oil, and natural gas and downstream activities, removing almost all the unwarranted deductions in order to establish transparency; my estimation is that up to 40% of revenue may be reduced, not captured due to the impact of multiple deductions from "chargeable oil and gas production" before the applicable or "Assessable Tax" rate of 85% is applied and the impact of 50% ITC from the deep water PSCs; and

vii. Government removal of the "cap of investor" will allow full assessment of the value of equity holding in the various JOA and PSC terms, and in the NNPC. On the former, the gross revenue earned or economic rent distribution to all the parties must be clearly segregated; e.g. between 'Royalty Oil', 'Tax Oil' and 'Profit Oil' to the Government and the distributable 'profit oil' between IOC/oil company as contractor and asset (license) owner company (NNPC). This is necessary to separate the umbilical code of 'FGN as an investor' and NNPC as a commercialised entity in the near future;

8.5 Management of Environment

Nigeria covers an area of 923,768 sq. km. At it widest, it measures about 1,200 km from east to west and about 1,050 km from north to south. Nigeria is located between 4°N and 14°N of the equator. The western frontiers runs from 3°E and the eastern reaches nearly 15°E of the meridian. The country's topography ranges from lowland along the coast and in the lower Niger Valley to high plateaus in the north and mountains along the eastern border. Nigerians suffer significantly from various types of disasters as a result of its location and impact of climate change. Disasters such as floods, landslides, tidal waves, coastal erosion, sand-storms, dust-storms, locust/insect infestations, oil spillage and other man-made disasters have claimed many lives in Nigeria and rendered many homeless. Oil spill disaster is caused either by tanker break up at sea, illegal discharged and tanker clean up, pipeline ruptures from operations or from sabotage. Oil is both physically and chemically hazardous with disastrous consequences in marine environments that are exposed to both chronic and acute pollution.
It is reported that about 2.4 million die annually[29] from all sorts of disasters, mainly man-made. In 1976, the Federal Government of Nigeria established the National Emergency Relief Agency (NERA) to coordinate its disaster response activities and this body was replaced in 1999, by the National Emergency Management Agency (NEMA).

8.5.1 Current Challenges on Environment matters[30]:

a) Nigeria is faced with a creeping environmental disaster; Losing about 50 metres to the Atlantic Ocean and some two kilometres to the Sahara Desert annually;

b) Official figures show that in 1981-1994, the country lost 3.7 million ha of forest and farmlands to erosion and other forms of soil degradation. Over the period of about 30 years the losses have totalled some 285,000 sq.km, or just under a third of Nigeria's land area;
   - Many environmentalists believe that the only chance of averting the looming disaster is to halt the process of deforestation and reclaim the land already lost.
   - the north-eastern state of Gombe has launched a tree-planting campaign- The government had plans to plant 4,000 hectares (ha) of trees per year.

c) Environmentalists estimate that Nigeria loses 3,000 ha of vegetation per year through tree-felling, bush-burning and general desertification. In the past four decades, 96 percent of its pristine forests have been cut down. We are only left with four percent (4%), which is serious and alarming in its implications for sustainable agriculture[31].

[29] NEMA
[30] NIGERIA: IRIN Special Report on environmental challenges- UN Office for the Coordination of Humanitarian Affairs 1999
[31] According to Dr. Muhtari Aminu Kano of the Nigerian Conservation Foundation

d) The federal ministry of agriculture estimates that 35 million tonnes of soil are washed away by erosion annually in Nigeria, mostly by gully erosion in the southeast, where the rain forests were most severely depleted in the last three decades;

e) In the south, coastal erosion, blamed mainly on rising sea levels caused by global warming, has been gradually eating into the land. Former rain forests have been laid bare, and in many places, gully erosion has made huge, yawning gaps on soil once held together by thick vegetation, swallowing houses and submerging farmlands.

8.5.2 Impact on Environment from fossil fuel and community

Oil is characteristically and intrinsically hostile to environment and the people that live surrounding it, suffers. The exploratory part is associated with opening up of the rain forest, mangrove swamps, and sundry seismic activities, which are injurious to the local people, the water courses, wildlife, fauna and flora. The mere opening up has introduced "invaders" to plunder resources, impact on the culture and moral ethos, which have led to the socio-economic dislocations of Niger Delta people and impoverished many.

Furthermore, oil pollution from spills, oil well blow-outs, oil ballast discharges and improper disposal of drilling mud from petroleum prospecting have resulted in problems such as: the loss of the aesthetic values of natural beaches due to unsightly oil slicks; damage to marine wildlife, modification of the ecosystem through species elimination and the delay in biota (fauna and flora) succession; and decrease in fishery resources.

Fossil fuels generate very serious environment impact and these problems have been summarized in Table 2, below. Coal, for instance, is the dirtiest of these fossils fuels and gas is the cleanest of them all.

Table 2
Environmental Impact of Fossil Fuel Resources- Source: NEST, 1991

Mining Activity	General Effects	Specific Impacts
Exploration	Landscape disturbance	Aesthetic deterioration of the landscape

Mineral Extraction	Land degradation and Ecosystem destabilization	Land surface devastation (including land subsidence, disruption of drainage systems, deforestation, excessive water draw-down, and lowering and contamination of the water table
Processing, Transportation storage and consumption	Gas leaks, oil spills, noise, and pollution of the air, soil, and water.	Thermal loading of waterways, increase in C02 and CO, ozone layer depletion, acidification of air, soil and water, weather modification, toxicity hazard to plants and animals, death of terrestrial and marine life, loss of crops and livestock, impairment of atmospheric visibility, vehicular accidents, damage to buildings and machinery, nervous disorders, respiratory diseases, cardio vascular illnesses, cancers from food.

The impact is also more on women who in rural economies are the 'engines' of the economy, in line with UNFEM findings that women constitute 60% of economic activities world-wide, though largely informally. Women are the purveyors of water, fuel wood for food, health care, sanitation, child bearing, and are most affected by deforestation, oil spills, soil erosion and gas flares, the most victims of climate change resulting to variation in weather that cause flood, drought and ecosystem degradation.

The images pertaining to these environmental matters are well captured by Osodi; "**Putting a face on Nigeria's "paradise lost";**[32] and other works that document the delta and **"the exploitation of its riches."** He compiled the resulting images into a book, the **"Delta Nigeria: The Rape of Paradise"**. His words are even more revealing. As a native of oil-rich Nigeria, he says he has seen the devastation, conflict and injustice caused by drilling for the "black gold." Like many in the Delta State, he feels only a few reap the benefits of the resource. His purpose of the intimate photographs is to give the victims a voice-"I want to show the duality of life in the delta region," he says. "It is amazing how people carry on with their lives, with their daily routines, with a smile against all odds. I want to put a human face on this paradise lost." Osodi says Nigeria relies too heavily on its oil supply and should look to cocoa, palm fruit and fish farming as alternative sources of revenue. He wanted to photograph the effects of the oil industry for posterity - particularly because he hopes "a time will come when the delta region will no longer be like this."

His pictures show the unglamorous side of Africa's leading oil producer: the pollution, poverty and damage. Children play on abandoned oil stations. Fiery gas flares lash out, scarring any who venture too close. Poisonous fumes fill the air as women and children dry out tapioca next to the

[32] **Courtesy of CNN**, compiled by photographer, George Osodi of Panos Pictures in Lagos.

flames. Many parts of the area are empty shells due to oil spill fires and militant gang activity. Osodi hopes his images will help trigger a transformation in the region. He wants to see the government step up for people like Pius Ogberemedaye, who lost his leg in the Nigerian Civil War in the late 1960s. Ogberemedaye's wife, Joy, has to work on a farm, and he receives no state pension, Osodi says. "I wanted to do something that reflects my soul. It's nice to document these processes, to inspire change and bring about development."
– by Elizabeth I. Johnson, CNN.

Highlight of the Manifestation of environmental issues:

a) Oil spill & Gas flaring:

There exists severe damage and evidence in locations from oil spills/gas flares on land, riverine creeks and habitat of communities whether arising from operation or wanton line vandalisation and induced policy gas flaring.

Examples of major spills that heated the industry include;

- In early year 2012, Shell's 200,000 barrel per day (bpd) Bonga facility - about 120 kilometers off the coast of the West African nation led to the biggest leak in Nigeria for more than 13 years, washing up on its densely populated coast. Shell said it happened while a tanker was loading oil, has led to the complete shutdown of the company's 200,000 barrel per day (bpd) Bonga facility;

- Two consecutive spills in 2008, caused by faults in a pipeline, resulted in thousands of barrels of oil polluting the lands and creeks of Bodo and Ogoniland; and

- According to some records, the problems reached a crescendo about 1999 resulting to over 100 shut-in of oil wells, of about half a million barrels per day.

b) The lawsuits;

The Royal Dutch Shell Nigeria has been slammed with a $1 billion law suit over the frequent oil spills and pervasive air pollution from its refining operations in Ogoni land. Amnesty International and the Centre for Environment, Human Rights and Development (CEHRD), said Shell must pay an initial sum of US$1 billion to begin the clean-up of oil spills it caused in the Niger Delta region.

c) Community Unrests:

Random barricades of oil company offices, oil locations; strikes by oil workers; are common place.

One of the community leaders, Obong Dennis Nkereuwem, gave the advice to Mobil Producing Nigeria (MPN) as a fallout of oil spills from the company's facilities in Ibeno, he

said such vigilance would not only save cost but also check environmental disaster from reaching a large-scale proportion as currently experienced in at the Gulf of Mexico in the United States of America. The Obong lamented in an interview that due to incessant oil spills and the attitude of the MPN, the hitherto cordial relationship between the oil company and the host community had given way to distrust and mutual suspicion. "It is not about compensation, it is about the environment, the degradation of the environment. Do you know the things that we lose every day because of the environmental problems from the oil spill? It is enormous;" the community leader lamented. He explained that frequent oil spills from the Qua Iboe oil fields had contaminated the shoreline, which was the major source of fishing for coastal settlements along the Atlantic, and that if such frequent spills were not checked, it might damage the relationship between the oil firm and communities in the area.

d) Militancy and increasing cost to government, investors and development agencies;

Militancy through hostage taking of oil workers, especially expatriates to demand ransom, piracy of boats, helicopters and oil equipment's are many of the vices common in Niger Delta. Although amnesty was granted in year 2009 with many giving up arms struggle, the matter has not been put to bed as a finality; the Joint Military Task Force (JTF) in the Niger Delta issued a seven-day ultimatum to all those in possession of illegal arms in the region to surrender them or face the full wrath of the law as criminals, on or before September 18, 2011[33]. Yet this month February 2012, attacks were made on Agip facilities.

The federal government announced the approval of a "Transitional Safety Allowance" for ex-Niger Delta militants. This is separate, and in addition to, the N65,000 that each militant has been collecting monthly since the start of the amnesty programme.

Other funding of Niger delta are from national budgets through the Ministry of Niger Delta, the Oil producing companies' contribution of 3% of their annual budgets to NDDC; the oil producing States of the Federation budgets; and the 13% derivation from oil revenues based on the 1999 constitution. As well as development agencies, as an example, on September 25, 2011 the European Union (EU) announced plans to spend €200m on projects in Nigeria. That most of the projects would be carried out in the Niger Delta.

In spite of millions of dollars of funding by these sources, there are insufficient basic social, economic infrastructures and amenities like clean water, electricity, healthcare, schools, communication, and small scale industries regardless of the production of a broad based initiative that garnered much national consensus that produced the Indicative Niger Delta Management Plan (INDMP). It will appear that this trend of lack of socio economic amenities is a general rule of all of Nigeria's rural communities, largely due to lack of priority to, plus misuse of funds meant for spending in rural projects.

[33] JTF Spokesman, Lt.-Col. Timothy Antigha, said in a statement in Yenagoa.

8.5.3 Government Laws and Responses on environment matters in the oil and gas sector:

The major laws regarding the environment include the following;

1. **The Minerals Oil (Safety) Regulations 1963**

The rules pertain to safe handling of mineral oil with specific rules on drilling and production operations; and others for handling crude oil and natural gas. That these regulations must also in addition, conform with international bodies of the Institute of Petroleum Safety Codes, the American Institute Code and the American Society of Mechanical Engineers codes, provides some international global best practice outlook.

2. **The Petroleum (drilling and production) Regulations, 1969 as amended (1993, 1979, 1995 and 1996)**

This regulation sets the procedure for;

- acquiring an oil prospecting (OPL) and Oil mining licence (OML), respectively; rights of licensee and lessee and limitations to those rights;
- obligation and protection for sacred land, protection of environment, water courses from pollution; procedures for abandonment and decommissioning of wells;
- proper recording and procedures for keeping accurate records of of quantities of crude and natural gas won, saved, and removed.

3. **Associated Gas Re-injection Act 1979, as amended (1985)**

The main purpose of the Act is to prevent and stop gas flaring and provisions includes;

- oil producing companies must submit to the Minister a preliminary programme or schemes for the viable utilisation of all associated gas produced; including reinjection etc.; and
- the grant of discretion by the Minister to permit the continued flaring of gas to companies is by issuing certificate to that effect; and penalties for flaring, currently is at ten Nigerian Naira per thousand cubic feet of gas (N10/MCF).

4. **Environment Impact Assessment Act 1992 (EIA)**

The EIA sets the principles, guidelines and procedures to enable prior consideration of environmental impact assessment on certain categories of projects, both public and private. EIA is mandatory and allows members of the public and experts to comment on the environmental, socio-economic impact of those projects and their activities.

5. Federal Environmental Protection Agency in 1988 (FEPA)/ the Federal Ministry of Environment, (FME), 1999

Before now various institutions/industry managed environmental matters and kept records as internal to them, not until, the establishment of the Federal Environmental Protection Agency in 1988 (FEPA) and the expansion of the Agency's mandate in 1992 to include the conservation of biodiversity and natural resources management. From FEPA came the creation of a full-fledged Federal Ministry of Environment (FME) which took place in June 1999 and it also established subsequently, a full-fledged Department of Planning, Research and Statistics.

6. National Oil Spills Detection and Response Act 2006 (NOSDRA), 2006

The act sets up the agency and duties of NOSDRA for preparedness, detection and response to oil spills in Nigeria and identification of high risk and priority areas.

7. The National Environmental Standards and Regulations Enforcement Agency, (NESREA), Act No. 19 of 2011

The main purpose of the NESREA regulation is to prevent and minimize pollution from all operations and ancillary activities from construction, decommissioning and demolition activities in the sector in the Nigerian environment.

The provisions of these regulations include;

a. a site waste management plan;
b. control of the use of fuel with low sulphur content such as natural gas or liquefied petroleum gas, control of nitrogenous gas emission;
c. obtain a storm water discharge permit, control dust, noise and fugitive emission, the use of hazardous substances;
d. ensure appropriate management of spent oil, prevent and control explosion hazards and comply with close-out guidelines;

e. Control of vehicular emission from petrol and diesel engines, which prohibits engine unit which emits excess pollutants to the environment, ban the importation of two-stroke engines rather import four-stroke engines; and

f. Operations that require permit according to NESREA regulation include: discharge of effluent, oil and gaseous emission into the environment, use of hazardous, restricted chemicals, release of hazardous or toxic substances into the water or land or air of Nigeria's ecosystem beyond the permissible limits, sludge disposal, blasting, storm water discharge and operational vehicular emission testing facility.

8.5.4 Recommendations on Environment management

In spite of all these laws and regulation, the Director General of (NESREA) Dr. Mrs. Ngeri Benebo at a recent workshop in Abakaliki[34] to sensitize stakeholders on the rudiments to observe environmental rules regretted that the uncontrollable exploration and exploitation of natural resources and other unsustainable activities that pollute the air, water and soil contribute to environmental degradation has become incompatible to human habitation. She noted that the key environmental issues of great concern include, water pollution, indoor and out-door air pollution, industrial pollution, biodiversity loss, erosion and flooding. Other causes she alleged were land degradation, desertification, poor urban solid waste management, indiscriminate burning, and noise pollution and wildlife crimes, and the growing problem of the dumping of near-end-of-life e-waste into the country.

Identification of environment management issues arising;

a. There exist too many regulators/agencies for the management of environment matters for the industry; and the authorities are realising conflict of roles, between authorities of the DPR, NOSDRA, NESREA and Ministry of Environment;

b. The penalties regarding some violations of some of these rules are extremely low and or do not represent present economic realities, as many were put in place in the early years of nationhood;
Examples:
   - Gas flare at N10 (or $0.06)/mcf.
   - Failure not to submit/comply with EIA, the penalty is between N50,000 (or $320 at current rate) and not more than N1 million (or $6,410).

[34] Sun news, 22th Feb 2011, "Our environment uninhabitable", NESREA DG laments

c. Proper enforcements are often not well spelt out;

d. Many of the vital data supplied to the regulators are treated as confidential;
    - Employees of both DPR and NOSDRA shall treat all information as confidential, except if required in court; and this makes complainants to have difficulty in obtaining data against oil spills; and

e. Lack of capacity, poor funding and/or the misapplication of funds meant for environment activities.

8.6 Obstacles to "Greening Nigeria"

Strides made in RE development in Nigeria:
Despite being a major petroleum producing and exporting country, Nigeria has for a long time imported refined petroleum products for domestic consumption. The country has recently made an entrance into the bio-energy sector by seeding the market with imported ethanol until enough capability exists for the domestic production of ethanol to meet the national demand of 5.14 billion liters per year. So far, investors have responded by investing over $3.86 billion in the construction of 19 ethanol bio-refineries, 10,000 units of mini-refineries and feedstock plantations for the production of over 2.66 billion liters of fuel grade ethanol per year. Also, another 14 new projects are in the offing. Of the 20 pioneer projects, 4 are at the conception phase, 8 are in the planning phase, and 7 are under construction with only 1 operational[35], the 17 Mgy CrowNek Green Energy ethanol plant. The $122 million CrowNek project, which opened in September 2008, was the first Nigerian ethanol facility to commence production, and uses cassava as a feedstock. In Nigeria, Crownek announced that it will construct up to 16 biofuel "mini-refineries" across Ekiti state, with projects expected to be completed before the end of the 2010[36]. Each refinery will produce 906,500 gallons of ethanol per year (365,000 liters) and will supply up to 8,000 ethanol stoves will be provided to state residents free of charge, with ethanol sold for cooking at $1.76 per gallon (or $0.466 per liter).

In Nigeria, Nosak Distilleries Ltd will raise production capacity at its Lagos facility to 540,000 liters per day from its current 350,000 liters per day. It also plans commission a new 150,000 liter per day facility in Calabar, Cross River. Its first facility was commissioned in 2001 and together the company supplies about 70% of local ethanol demand.

In line with these, future biomass energy to produce fuel ethanol relies on farmers and recent government schemes on farming emphasise cassava, sugarcane, soya beans oil, palm oil etc. but this effort should be backed by fiscal and regulatory framework. The biomass sector can speed up the transition from reliance from oil to renewable.

Other global developments to compare with, reported by Bio Digest, states that in Belgium, the European Union energy commissioner has said he is against raising biofuel blending targets above 10% until sustainability issues have been addressed, but is in favour of setting targets for 2030 within the next two years. Whether or not those targets will be binding will all depend on the EU's ability to guarantee sustainability including their economic competiveness with fossil fuels. An EU report on the use of biotech crops, stating that approximately 160 million hectares of biotech/GMO crops were planted, this represents an 8% increase, and the work of 16.7 million farmers spread over 29 countries. ISAAA also reported a more than four-fold increase by farmers in the Czech Republic, Poland, Portugal, Romania, Slovakia and Spain as their acreage increased from 23,297 ha of maize in 2010, to 114,490 in 2011. The U.S. still leads the world with 69 million hectares planted in 2011.

[35] **Elijah I. Ohimain** http://www.sciencedirect.com/science/article/pii/S0301421510005689)
[36] Crownek to launch 16 ethanol mini-refineries in Nigeria in 2010: fuel for cooking stoves, March 19, 2010, Biofuel Digest

Lagos is to generate electricity from dumpsites[37]; Lagos State Waste Management Authority (LAWMA) has set in motion plans to start electricity generation from about 20-landfill sites across the state, that will improve municipal solid waste management and reduce its carbon footprint through Closure, Collection and Utilization of Landfill Gas (LFG) capture. About 20, 000 metric tonnes (mt) of waste were being projected from the sites daily (with about a minimum of 500 and maximum of 1000mt daily/site). One of the waste's to energy plant would be sited to generate electricity to neighbouring communities and the Third Mainland Bridge. The objectives include capturing of methane generated from waste, utilizing it for electricity, preventing the release of hazardous gases into the environment, reducing Lagos carbon footprint and compliance with international standards on environmental governance. The LAWMA Managing Director, Mr. Ola Oresanya, made this disclosure during a stakeholders' meeting tagged: 'Landfill Gas Recovery and Utilization Project at Abule-Egba, Olushosun and Solous Landfills', held in conjunction with the United Nations Environmental Programme (UNEP), African Carbon Asset Development (ACAD) and Standard Bank, at Simpson Transfer Loading Station. This is part of the process of developing and registering a Clean Development Mechanism (CDM) project under the Kyoto Protocol /UNFCCC and the project timeline is between 15-18 months.

Whilst progress is being made, the major challenges include:

1. **No Clear-cut National Policy or Strategy for Low Carbon Energy Development in Nigeria**

There is no clear-cut national policy or strategies for low carbon energy development in Nigeria. However, the Federal Government has developed a number of policy documents and strategies aimed at growing Nigeria's energy sector along a low carbon pathway. The Federal Ministry of Environment (FME) drafted the first National Communication under the UNFCCC in 2003 but implementations of the contents have been weak and the second National communication is long overdue.

In another development, a Presidential directive was given to NNPC for the exploration of Renewable Energy sources of energy initiative and to coordinate UNFCCC/Kyoto requirements, which led to the creation of Renewable Energy Division (RED) in August 2005.

An inter-ministerial committee, made up of relevant ministries, the NNPC, Nigerian Metrological Agency (NIMET), National Planning Commission and some NGOs, were officially charged to advice FGN on Climate Change (CC) policies, and the group met quarterly, but in recent times, their activities have waned. Multiple ministries are involved in one capacity or another, such as;

i. The Energy Commission of Nigeria (ECN), has produced other policy documents on CC and are involved in implementing aspects of adaptation projects;

ii. A Presidential Implementation Committee on clean development mechanism (CDM) was established in the office of the Secretary to Government;

[37] Report by Tessy Igomu, Sun news, February 24, 2012

iii. A proposed Hydro Power bill is before the national assembly;

iv. Proposed bill on desertification is/are before NASS;

v. The regulatory agency of the Nigerian Standards, Enforcement and Regulatory Agency (NSERA) and proposed Climate Change Commission (CCC) are located in the President's office; amongst others.

However, there is no defined scope of action or coordination amongst these departments. While several efforts have been made over the last decade to develop a framework as to how a renewable energy plan might take shape in the Nigerian economy, these initiatives remain largely abstract due to the lack of economic activity in the sector and a central coordinating point. None of the following policy plans have been passed into law.

a. **The National Electric Power Policy of 2001**

This plan provided for electricity supply for the rural areas (off-grid and minigrid systems) will be from renewables. It proposed joint electricity and natural gas capacity expansion in order to utilize flared gas for electricity generation. It listed a number of strategies for achieving these objectives, among which are fiscal and tax incentives, and capacity expansion for domestic production of low carbon energy. The National Energy Policy of 2001 provided for optimum utilization of the nation's renewable energy resources. The policy emphasized the need for adequate energy supply for domestic, commercial and industrial utilization and provided for intensive development of joint electric power and gas supply to at least 75 per cent of the population by 2020. Among the strategies listed for achieving these objectives include ensuring increased indigenous participation in planning, design and construction of low carbon systems; encouraging the establishment of necessary infrastructure for the effective gathering, transmission and distribution of gas nationwide, etc. However, this policy has over the years not guided government action on the energy sector.

b. **The Renewable Energy Master Plan (REMP) of 2005**

This plan articulates Nigeria's vision, targets and road map for addressing key development challenges facing Nigeria through the accelerated development and exploitation of renewable energy. It proposes programmes for developing renewable energy to ensure that the visions and targets are realized. Some of the strategies for achieving these objectives include adoption of a renewable portfolio standard; creation of innovative fiscal and market incentives to grow renewable energy industries; and preferential customs duty exemptions for imported renewable energy technology components – among others. Like the energy policy, the government has not implemented the master plan to a reasonable level.

c. **The National Bio-fuels Policy of 2007**

A biofuels inter-ministerial committee, with the NNPC as champion, was set up to develop the policy, incentives, and regulatory document on biofuels and was ratified by the Federal Executive Council and subsequently gazetted as No. 72, Volume 94, pages 180-193 of 20th June, 2007, which is awaiting passage as an Act.

This policy aims at firmly establishing a thriving bio-fuel industry utilizing agricultural products as a means of improving the quality of automotive fossil-based fuels in Nigeria. The policy stipulated a 10 per cent blending of fuel ethanol with gasoline (PMS) and diesel (AGO) to achieve a blend to be known as E-10, and 20 per cent of biodiesel with conventional diesel by 2020. Like most of the government's policy documents on the energy sector, there has been little commitment to implement the biofuels policy.[38]

2. Lacking Skills Capacity

The lack of skilled labour also poses a major problem to implementation of green development in the country. According to the former governor of the Central Bank of Nigeria, Charles Soludo, "more than 70% of Nigerian graduates were not only unemployable but also lacked basic skills to make them trainable for skilled employment." As a result, many larger companies, namely multinationals, seek skilled labour from elsewhere in order to fill the gap, which only adds to operating costs, as they have to pay foreigners higher salaries.

The skills gap is exacerbated by the failing education sector in Nigeria, which fails to produce skilled talent to meet industry resource needs and requirements. In an attempt to address the continuing declining standard, the sector has seen a sharp rise in the establishment of private institutions over the past decade with great support given by the Federal Government. Nonetheless, any benefits derived from these private institutions in filling the gap is ultimately negated by the on-going Diaspora trend which analysts have long argued is one of the most crippling hindrances to development in Nigeria, green or otherwise. Moreover, there is little to no relevant research and development activities taking place in Nigerian universities despite their potential to stimulate both public and private industry investment and infrastructure growth, especially in areas surrounding alternative technology. In the United States, for instance, research and development activities are known to be instrumental in encouraging pro-green policy by government.

3. Low Political Will

In Nigeria, there is a general association of green energy projects with rural development which is perceived as slower, less impactful mechanism for the scale of growth needed in the country. Rapid rural to urban migration puts increasing pressure on major cities like Lagos and Abuja to expand infrastructure to accommodate newcomers. As a result, rural and off-grid communities remain underdeveloped and in need much growth and investment. Political neglect of these regions perpetuates the trend of stagnant or non-existent development in the areas of energy, power and infrastructure development which disconnects the scant rural agricultural and supply networks from reaching urban markets.

Lack of institutional memory and frequent changes in administrations commonly result in the abandonment of resources and funding for green projects and initiatives. Classic examples include communities like the Bishop Kidjoe Island located off Lagos mainland which managed to get the attention of the Government to address their energy concerns. Lagos State had addressed the energy needs of the off-grid community by providing a solar system to generate kw of

[38] "Low Carbon Africa: Nigeria." Christian Aid, November 2011.

power, however, the benefits were short lived. The project soon collapsed after no maintenance or follow up was provided returning the community to their prior state of darkness and neglect.

4. Information Gap in Nigeria's Green Development

There is limited information published on renewable energy projects that States have initiated. Market research, feasibility studies and status reports on past, ongoing, or discontinued green energy projects are not made readily available to the public by State Governments. Inadequate records-keeping, lack of transparency and low inter-ministerial communication makes tracking the status or performance of State-funded projects a cumbersome task.

5. Perceived Financial Risk of Local Financial Institutions

Low carbon energy technologies often have high initial costs and this affects the overall cost of energy produced per KWh. Without adequate financial incentives, market expansion will be difficult. Further, financial institutions are not always willing to provide credits to low carbon projects as these are perceived to have higher degrees of risk than conventional energy projects. These projects usually have long gestation periods. The Nigerian financial sector is a short-term lender, making access to long-term investment finance daunting.

6. Little progress made in enhancing participation in the global carbon market.

There is little access made into global financial Institutions and markets set up under the UNFCCC such as the Joint Implementation projects (JIP); and Clean Development Mechanism (CDM) - the world's largest generator of carbon offset credits. This should be a stimulant to Nigeria's energy market, especially where gas is being flared resulting to both economic waste and CO2 hazard. According to information[39], in 2009, out of 100 CDM projects in Africa, six are from Nigeria with two registered to reduce gas flaring and four were awaiting validation.

According to the UNFCCC report of 2011, it states that a total 3, 542 projects were registered world-wide by 72 countries for CDM and 81.87% came from Asia, followed by 15.70% from, Latin America and the Caribbean, 2.03% from Africa and the remainder others was 0.40%. Additionally, from records of the UN, there seems to be no certified emission reductions (CERs) issued by any host party to Africa yet and Nigeria. Of the issued CER's, (more than 750 million), were valued at $20 Billion (USD)[40]. This means Nigeria is losing/missing opportunities' of funding projects and a draw-down of emissions. The FME is the authority for approving CDM projects and the NNPC is said to have created a CDM working group and also did organise a conference in 2008 to sensitise their partners, the IOCs and the private sector, but so far it has not been used effectively as a sustainable development strategy.

[39] NNPC News, 'Oil Industry poised to reduce gas emissions'; by Sanusi Barkindo, August 2009
[40] UNFCCC, CDM, Executive Board Annual Report, 2011

8.7 Recommendation for efficient management of the Energy sector for effective transition to green economy

This section focuses on what we need to do to ensure efficient management of energy and the approach to a green economy by following process of reviewing the current;

- Structure & Management of Energy sector;
- Policies & Energy Laws - These laws are the primary authorities (such as case laws, statutes, rules, regulations and edicts) related to energy both renewable and non-renewable;
- Establishing Sustainable Energy Planning, R & D, and Technologies;
- Recommending & Selecting Best Practices -Best practices were selected based on the following requirements and analyses: The practices chosen must be "demonstrative" and must shed light on the future rather than the past.

8.7.0 RECOMMENDATION 1: Structure & Management of Energy matters

First, there is need to have one or a single energy regulator, hence the need to re-align, harmonise existing structures-organisation, management and policies on Energy.

The Policy on energy Supply & Demand planning should be drawn based on a long term view of the direction of a country over a minimum period of 100 years. The lack of a central coordinating unit for energy matters has created a situation whereby the Presidency has become the ultimate coordinator, with the President providing approvals to the energy-petroleum sector and the Vice President being the Chairman of the Presidential Task force on Power Sector committee. This must take a lot of their valued attention from the bigger picture of the nations' economy and security, neither is it a sustainable way to run institutions. The ultimate goal is to supply adequate energy to support growth and development of the economy from viable sources and to have a one-stop shop that assesses what infrastructure is necessary for such to happen that can lead to industrial development. Thus there is a need to have central coordination for planning of sources of energy supply and for managing demand in Nigeria, from the current dispersed supervisory authorities.

Samples: Best Practice Models;

1. The National Energy Board (NEB) of Canada[41].

The Board's corporate purpose is to regulate pipelines, energy development and trade in the Canadian public interest. This principle guides the Board in carrying out and interpreting its regulatory responsibilities. The Board is accountable to Parliament, to which it reports, through the Minister of Natural Resources.

The Board regulates the following specific aspects of the energy industry:

- the construction and operation of interprovincial and international pipelines;
- pipeline traffic, tolls and tariffs;

[41] NEB website

- the construction and operation of international and designated interprovincial power lines;
- the export and import of natural gas;
- the export of oil and electricity; and
- Frontier oil and gas activities.

Other responsibilities include:

- providing energy advice to the Minister of Natural Resources in areas where the Board has expertise derived from its regulatory functions;
- carrying out studies and preparing reports when requested by the Minister;
- conducting studies into specific energy matters;
- holding public inquiries when appropriate; and
- monitoring current and future supplies of Canada's major energy commodities.

In addition to its responsibilities under the *National Energy Board Act* (NEB Act), the Board also has responsibilities under the *Canada Oil and Gas Operations Act*, the *Canadian Environmental Assessment Act*, the *Northern Pipeline Act*, and certain Provisions of the *Canada Petroleum Resources Act*. As a result of the *Canada Transportation Act*, which came into effect on 1 July 1996, the Board's jurisdiction has been broadened to also include pipelines that transport commodities other than oil or natural gas.

2. Ofgem- is the Office of the Gas and Electricity Markets.

It is the independent energy regulator, is responsible for regulation of the energy markets in England, Scotland and Wales, established by the Utilities Act 2000. Ofgem is governed by an Authority, consisting of non-executive and executive members and a non-executive chair. Non-executive members bring experience and expertise from a range of areas including industry, social policy, environmental work, finance and Europe. The Authority's powers are provided for under the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998 and the Enterprise Act 2002.

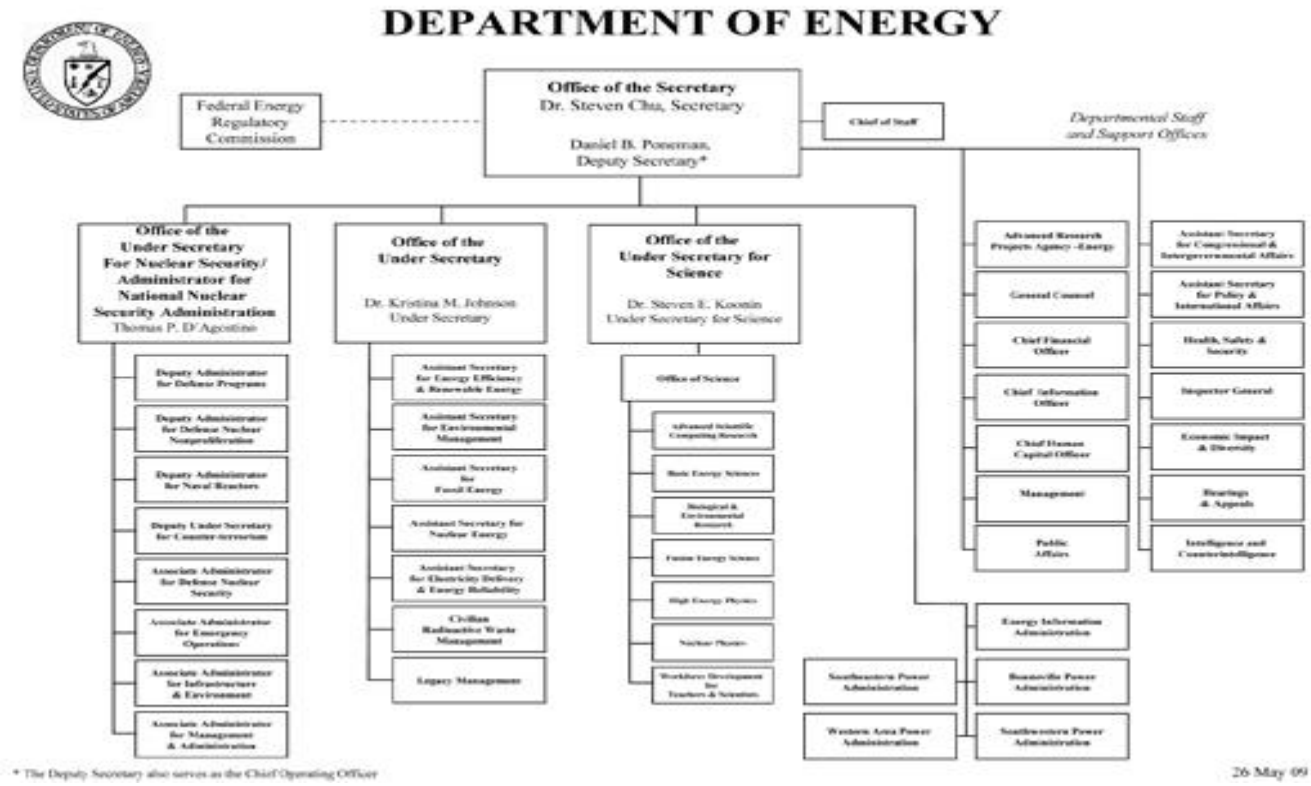
In September 2003, a trilateral agreement was signed between the NEB, Comisión Reguladora de Energía (CRE) of Mexico and U.S. Federal Energy Regulatory Commission (FERC), in which the three agencies agreed to regularly share perspectives on regulatory approaches and to work on eliminating inconsistencies in regulation to the extent possible. The NEB, CRE and FERC have been meeting three times a year to pursue these objectives. It was at the trilateral meeting, in May 2004, that the NEB and FERC signed a Memorandum of Understanding to enhance interagency coordination. This agreement reinforces the existing cooperative relationship and further commits each agency to work together to the extent possible within our respective legal mandates to harmonize our regulatory approaches to cross-border projects.

3. The Department of Energy and the Federal Energy Regulatory Commission (FERC) of USA.

The 1973 oil crisis called attention to the need to consolidate energy policy. On August 4, 1977, President Jimmy Carter signed into law on the Department of Energy Organization Act of 1977

(Pub.L. 95-91, 91 Stat. 565, enacted August 4, 1977), which created the Department of Energy. The new agency, which began operations on October 1, 1977, assumed the responsibilities of the Federal Energy Administration, the Energy Research and Development Administration, the Federal Power Commission, and programs of various other agencies.

The Department is under the control and supervision of a United States Secretary of Energy (of cabinet status, like a Minister of Energy), a political appointee of the President of the United States. The Energy Secretary is assisted in managing the Department by a United States Deputy Secretary of Energy, also appointed by the President, who assumes the duties of the Secretary in his absence. The Department also has three Under Secretaries of Energy, each appointed by the President, who oversee the major areas of the Department's work. To aid the Under Secretaries in the performance of their duties, the President also appoints eight Assistant Secretaries of Energy. The Energy Secretary assigns their functions and duties.



Subsequent developments included some structural re-alignments carried out in the USA, when it passed The Energy Policy Act of 2005 (EPAct), as the first major comprehensive energy legislation in more than a dozen years. Before this event, the Department of Energy and its constituent Federal Energy Regulatory Commission (FERC) were created in 1977, through the Department of Energy Organization Act as an independent agency. FERC regulates the interstate transmission of natural gas, oil, and electricity and has authority under the EPAct over wholesale power, gas markets, and civil authority to protect customers, as the Act modified the existing Federal Power Act of 1935, the Natural Gas Act of 1938 and the Public Utility Regulatory Policies Act of 1978 (PURPA). In further details, FERC regulates the following industries:

Electricity

FERC is responsible for regulating interstate transmission rates and services, wholesale energy rates and services, corporate transactions, mergers, and securities issued by public utilities.

Hydropower

FERC is responsible for licensing of non-federal hydroelectric projects, overseeing related environmental matters, and inspecting non-federal hydropower projects for safety conditions and compliance with license terms and conditions.

Gas

FERC is responsible for regulating interstate transportation rates and services for natural gas pipelines, the construction of natural gas pipelines, and overseeing related environmental matters.

Liquefied Natural Gas (LNG)

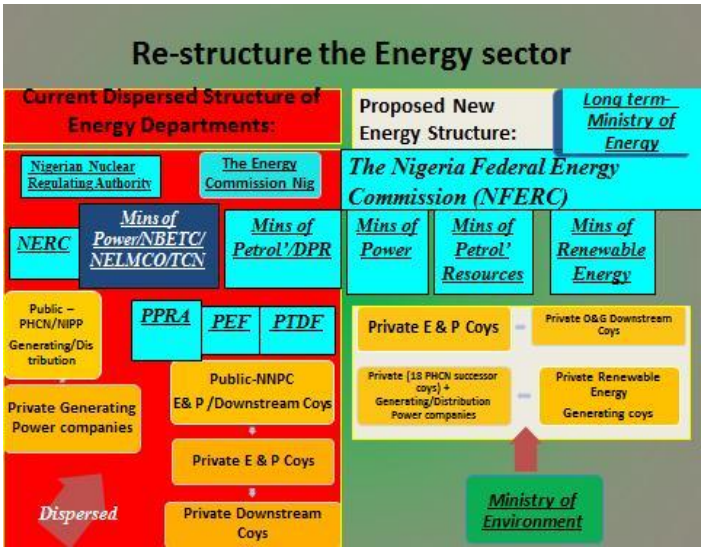
FERC is the lead agency that approves the construction and operation of LNG terminals. FERC works closely with the US Coast Guard, States, and local communities to evaluate the environmental, safety and security aspects of proposed and operating LNG terminals and tankers.

Oil

FERC is responsible for regulating interstate transportation rates and services of crude oil and petroleum products.

The Department of Environment is a key partner to FERC for setting, manning required standards and enforcing compliance.

Management of Nigeria's energy structure:



At present Nigeria's energy sector is dispersed in supervision and policies. The recommended structure to meet those future needs starts with the revision of Nigeria's current policy and structure as described by the chart (Re-structure the Energy Sector).

The creation of Ministry of Energy (MOE) in 2007 by the last administration was a step in the right direction to harmonise energy sub-sectors but the inter-functional politics amongst the subsector ministers of Sate, ensured its demise. Under the MOE were Departments of Petroleum; Power, and were headed by a Ministers of State. Unfortunately no full time MOE minister (except the President who played the role) was appointed in the period. An Energy Minister was to emerge only for a few months before the hand-over to the next government. This lack of a strong structure paved the way for intra-department feud and eventual devolution of the MOE by the subsequent administration. The oil and gas sector institutional reforms fall under the PIB but should be noted that the main thrust in the bill is the balkanisation of the duties of the Minister of Petroleum into

more institutions at greater administrative cost to government; it is not a panacea for linkages to other energy sectors therefore.

The power sector/PHCN has had at least three committees with different members coordinating power matters since the inception of democracy in 1999. Prior to this there were constant changes of the management under various military regimes, leading to no single investment in the power sector in 20 years! Furthermore, the lack of effective linkages in the total energy sector created a glaring isolation of plans between the oil and gas sector and the power sector (PHCN), to the extent that several gas turbine plants, allegedly the Geregu, Kogi State(414MW); Omotosho, Ondo State (335MW); Papalanto, Ogun state (35MW) were constructed and commissioned in 2007 without any gas pipeline to deliver gas to the plants.
The Minister of Power recently announced that great effort is underway to consolidate the power sector institutions or agencies, move staff within and house all of them in the current PHCN headquarters; indeed PHCN is no longer legally in existence under the Electricity Power Sector Reforms (EPSR) Act of 2005. Those agencies related to Power sector alone include the Federal Ministry of Power, the Nigerian Electricity Regulatory Commission (NERC), the Nigerian Bulk Electricity Trading Company (NBETC), The Nigerian Electricity Liabilities Management Company Ltd (NELMCO) and the Transmission Company of Nigeria (TCN).

The **Nigerian Electricity Regulatory Commission (NERC)**, which was inaugurated on December 22, 2010, as provided in the Electric Power Sector Reform Act of 2005, with the mandate to supervise the electricity sector of Nigeria, has control on licencing for generation and distribution to the public company, the Power Holding Company of Nigeria (PHCN) and private generating companies.
Some aspects of the policies and administration of natural gas and downstream gas are embedded in the recent executive sponsored PETROLEUM INDUSTRY BILL (PIB) of 2009/2010 includes the policies of ownership, open access of pipelines and access to natural gas by 3rd parties that will best be served under the new FEC.
There is also the **Department of Petroleum Resources (DPR**) that regulates the licencing of oil and gas operation, permits to operate in the sector and downstream operations, licensing and standards.
The Energy Commission of Nigeria (ECN) evaluates energy policy and assesses supply and demand but lacks oversight control on any operating unit. Since its establishment, about 1979, it has struggled to put in place an energy Act for the nation.
The **Nigerian Nuclear Regulatory Authority (NNRA)**, set up in 2001 was established to ensure efficient, safe introduction of nuclear into the energy mix of Nigeria.
The necessary linkage amongst these multiple regulators is very weak between the power sector and the sources of energy suppliers, the petroleum (oil and gas), coal, nuclear, and more recently renewable energy.
Therefore, it is recommended, going by the USA, U.K. Canadian practice to upgrade and restructure NERC; the Nigerian Energy Commission (NEC); and other units into a **Nigeria Federal Energy Commission (NFERC)**, **The DPR**, **PPRA**, **PEF**, **NNRA**, **amongst others** to encompass all, have oversight functions on all the energy players (operator), without jeopardising the details of those functions.

The success of this re-alignment is contingent on a home grown policy in developing R & D, technologies because of the legacies of over-reliance on foreign technology, management of resources and low local content input materials and services.

8.7.1 RECOMMENDATION 2: Energy Policies & Laws

Attestations suggest that when policies and legislations are enunciated on any matters, there is greater chance to follow through implementation. There is need to have one encompassing set of energy laws/legislation due to their interrelationships in planning demand and supply from all sources of energy and for sustainable energy security. The desired levels of policies and legislation should be at International, Regional, National (States/LGCs) and at Corporation/Public sector levels (see example in Table 3), such that there will be complete synergy of purpose.
Example:
Table 3.

Level	**Energy Policy/Legislation (Including RE)**	**USA**	**UK**	**Nigeria**
International	UNFCCC/Kyoto	✓	✓	✓
Regional		NAFTA/MOU with Canada	EU	ECOWAS – none?
National		EP(Act) 2005	The Utilities Act 2000	Dispersed- EPRSA; Petroleum Act, 1969-proposed PIB, NNRA, PPTA etc.
Public/Corporation		✓ [42]	✓	None

a. Sample Policy: national policy on renewable energy, UK government;

"The Government is committed to increasing the proportion of energy we use from renewable sources. The UK has been blessed with a wealth of energy resources but the depletion of our domestic fossil fuels reserves, combined with projected growth in global energy demand, puts our security of energy supply at risk. Exploiting our renewable resources will make a strong contribution to our energy needs and allow us to be less reliant on others. Our drive to increase the proportion of energy we obtain from renewable sources will not only increase the security of energy supplies in the UK; it will also provide opportunities for investment in new industries and

[42] The U.S. Environmental Protection Agency (EPA) has named the top 20 partners in its Green Power Partnership that are generating their own renewable energy on-site. Combined, the top 20 partners are generating more than 736 million kilowatt-hours of renewable energy on-site each year, enough to power more than 61,000 average U.S. homes.

new technologies. The Government will help business develop in this area to put the UK at the forefront of new renewable technologies and skills."[43]

b. Sample Law on RE: China's new Renewable Energy Law:

In 2005, the passage of China's new Renewable Energy Law, one of the world's largest economies has now made one of the largest state-sponsored commitments toward renewable energy. China's government imposed a national renewable energy requirement that is expected to boost the use of renewable energy capacity up to 10 percent by the year 2020. The law requires power grid operators to purchase resources from registered renewable energy producers. The law also offers financial incentives, such as a national fund to foster renewable energy development, and discounted lending and tax preferences for renewable energy projects. Rapid economic development throughout China has resulted in a significant increase in energy consumption, leading to a rise in harmful emissions and power shortages. The Renewable Energy Law is designed to help protect the environment, prevent energy shortages, and reduce dependence on imported energy.

China's new law sets the stage for the widespread development of renewables, particularly for commercial scale renewable generating facilities. Through this legislation, the State officially encourages the construction of renewable energy power facilities. China's electricity grid is obligated to purchase all the electricity generated by approved renewable energy facilities located in its service area. The grid's buying price for renewables will be set by the National Development and Reform Commission (NDRC), a regulatory department of the State Council. NDRC will adjust the buying price from time to time as necessary. The cost of purchasing this power will be spread across all customers on the grid.

NDRC will also implement a national renewable energy plan, including specific renewable energy targets that will act as the framework for implementation of the law. Provincial planning agencies will then develop their more specific implementation plans. The law includes other details related to the purchase and use of solar photovoltaics (PV) and solar water heating as well as renewable energy fuels. Finally, the law includes specific penalties for non-compliance with the law.

In 2003, China's renewable energy consumption accounted for only 3 percent of the country's total energy consumption. The government plans to lift up the figure to 10 percent in 2020.
According to the law, renewable energy includes hydroelectricity, wind power, solar energy, geothermal energy and marine energy, all of which should be taken consideration in state and local development plans.

c. Sample Law: The Energy Policy Act of 2005[44];

A good example is the first comprehensive laws passed in recent times by the USA, in spite of several and past extant energy related laws.

[43] Source:-Department of Energy & Climate Change, UK
[44] Wikepedia

The general provisions cover fossil and renewable energy sources, and include:

- ☐ Under an amendment in the American Recovery and Reinvestment Act of 2009, Section 406, the Energy Policy Act of 2005 authorizes loan guarantees for innovative technologies that avoid greenhouse gases, which might include advanced nuclear reactor designs, such as pebble bed modular reactors (PBMRs) as well as clean coal and renewable energy;
- ☐ the Act increases the amount of biofuel (usually ethanol) that must be mixed with gasoline sold in the United States to 4 billion US gallons (15,000,000 m3) by 2006, 6.1 billion US gallons (23,000,000 m3) by 2009 and 7.5 billion US gallons (28,000,000 m3) by 2012; two years later, the Energy Independence and Security Act of 2007 extended the target to 36 billion US gallons (140,000,000 m3) by 2022.
- ☐ it seeks to increase coal as an energy source while also reducing air pollution, through authorizing $200 million annually for clean coal initiatives, repealing the current 160-acre (0.65 km2) cap on coal leases, allowing the advanced payment of royalties from coal mines and requiring an assessment of coal resources on federal lands that are not national parks;
- ☐ it authorizes subsidies for wind and other alternative energy producers;
- ☐ it adds ocean energy sources, including wave and tidal power for the first time as separately identified, renewable technologies;
- ☐ it authorizes $50 million annually over the life of the law for biomass grants;
- ☐ it includes provisions aimed at making geothermal energy more competitive with fossil fuels in generating electricity;
- ☐ it requires the Department of Energy to:
- ☐ study and report on existing natural energy resources including wind, solar, waves and tides;
- ☐ study and report on national benefits of demand response and make a recommendation on achieving specific levels of benefits and encourages time-based pricing and other forms of demand response as a policy decision;
- ☐ designate National Interest Electric Transmission Corridors where there are significant transmission limitations adversely affecting the public (the Federal Energy Regulatory Commission may authorize federal permits for transmission projects in these regions);
- ☐ report in one year on how to dispose of high-level nuclear waste;
- ☐ it authorizes the Department of the Interior to grant leases for activity that involves the production, transportation or transmission of energy on the Outer Continental Shelf lands from sources other than gas and oil (Section 388);
- ☐ it requires all public electric utilities to offer net metering on request to their customers;
- ☐ it prohibits the manufacture and importation of mercury-vapor lamp ballasts after January 1, 2008;
- ☐ it provides tax breaks for those making energy conservation improvements to their homes;
- ☐ it provides incentives to companies to drill for oil in the Gulf of Mexico;
- ☐ it exempts oil and gas producers from certain requirements of the Safe Drinking Water Act;
- ☐ it extends the daylight saving time by four to five weeks, depending upon the year;

- ☐ it requires that no drilling for gas or oil may be done in or underneath the Great Lakes;
- ☐ it requires that the Federal Fleet vehicles capable of operating on alternative fuels be operated on these fuels exclusively (Section 701);
- ☐ it sets federal reliability standards regulating the electrical grid (done in response to the 2003 North America blackout);
- ☐ it includes nuclear-specific provisions;
- ☐ it extends the Price-Anderson Nuclear Industries Indemnity Act through 2025;
- ☐ it authorizes cost-overrun support of up to $2 billion total for up to six new nuclear power plants;
- ☐ it authorizes production tax credit of up to $125 million total a year, estimated at 1.8 US¢/kWh during the first eight years of operation for the first 6.000 MW of capacity, consistent with renewables;
- ☐ it authorizes loan guarantees of up to 80% of project cost to be repaid within 30 years or 90% of the project's life;
- ☐ it authorizes $2.95 billion for R&D and the building of an advanced hydrogen cogeneration reactor at Idaho National Laboratory;
- ☐ it authorizes 'standby support' for new reactor delays that offset the financial impact of delays beyond the industry's control for the first six reactors, including 100% coverage of the first two plants with up to $500 million each and 50% of the cost of delays for plants three through six with up to $350 million each for;
- ☐ it allows nuclear plant employees and certain contractors to carry firearms;
- ☐ it prohibits the sale, export or transfer of nuclear materials and "sensitive nuclear technology" to any state sponsor of terrorist activities;
- ☐ it updates tax treatment of decommissioning funds;
- ☐ it directs the Secretary of the Interior to complete a programmatic environmental impact statement for a commercial leasing program for oil shale and tar sands resources on public lands with an emphasis on the most geologically prospective lands within each of the states of Colorado, Utah, and Wyoming.

Various Tax reductions by subject area include:

- ☐ $4.3 billion for nuclear power
- ☐ $2.8 billion for fossil fuel production
- ☐ $2.7 billion to extend the renewable electricity production credit
- ☐ $1.6 billion in tax incentives for investments in "clean coal" facilities
- ☐ $1.3 billion for energy conservation and efficiency
- ☐ $1.3 billion for alternative motor vehicles and fuels (bioethanol, biomethane, liquified natural gas, propane)
- ☐ $500 million Clean Renewable Energy Bonds (CREBS) for government agencies for renewable energy projects.

A new revised energy policy thrust for Nigeria will be relevant to revise and review all extant energy related legislations on regulations and policies to identify all areas of overlap on responsibilities, and enforcements, which include but not limited to;

a) The Petroleum Act, 1996; and the proposed Petroleum Industry Bill (PIB), 2009/2010 including the sub-regulators;
   - The Department of Petroleum (DPR);
   - The Petroleum Pricing Regulatory Authority (PPRA) – set up to establish prices of oil products;
   - Petroleum Equlisation Fund (PEF), set up to enforce uniform pricing of petroleum pricing across the country by paying for bridging cost (a form of subsidy);
   - Petroleum Training Development Fund (PTDF) Act 1999): -"Responsible for developing, promoting and implementing petroleum technology and manpower development";
b) The National Electric Power Policy of 2001 and Nigerian Electricity Regulatory Commission, 2005;
c) The Renewable Energy Master Plan (REMP) of 2005;
d) The National Bio-fuels Policy of 2007; and the proposed Climate Change Commission Bill, 2010
e) The Gas Master Plan; the NIPP programmes;
f) The Hydropower bill;
   and
g) Nigeria Atomic Energy Commission Act 46 and 1976 and the Nigerian Nuclear Regulatory Authority in 2001.

8.7.2 RECOMMENDATION 3: Establishing Sustainable Energy Planning, R & D, and Technologies

Energy planning is the process of developing long-range policies to help guide the future energy systems that uses integrated approaches that consider both the provision of energy supplies and the role of energy efficiency in reducing demands. Energy planning should always reflect the outcomes of population growth, evaluation of energy markets to estimate demand, prices and future prices, "market power" and also addressing issues such as when Nigeria's oil and gas attains "Peak Oil" (what if?); and determining long range sources of energy supplies among others.

The trend is for a more holistic integrated "sustainable" energy planning systems with concerns growing over the environmental impacts of energy consumption and production, particularly in light of the threat of global climate change. Many OECD countries and some U.S. states are now moving to more closely regulate their energy systems. For example, many countries and states have been adopting targets for emissions of CO2 and other greenhouse gases.
There are vast numbers of policies and legislation relevant to planning for energy (both for renewables and non-renewable). These exist at the very local level, for example through local development plans, to national and the international, such as the Kyoto Protocol as well at enterprise levels-corporations.

Sample R & D in the USA[45]:

The National Renewable Energy Laboratory (NREL), located in Golden, Colorado, is the United States' primary laboratory for renewable energy and energy efficiency research and development. NREL was established 1974 and runs a Budget of this magnitude (often fluctuates) of about $328 million (2009), broken down between its major groups.; Wind $33.9 million; Biofuels $35.4 million; and Solar $72.4 million. The National Renewable Energy Laboratory (NREL) is a governSment-owned, contractor-operated facility; it is funded through the U.S. Department of Energy (DOE). This arrangement allows a private entity to operate the lab on behalf of the federal government under a prime contract. NREL receives funding from Congress to be applied toward research and development projects. NREL also performs research on photovoltaics (PV) under the National Center for Photovoltaics. NREL has a number of PV research capabilities including research and development, testing, and deployment. NREL's campus houses several facilities dedicated to PV research. Ultimately, many of the deployed technologies help mitigate the oil dependence of the United States, reduce carbon emissions from fossil fuel use, and maintain U.S. industry competitiveness. NREL offers licensing for many of its technologies related to energy efficiency and renewable energy development. Licensing of NREL's intellectual property is available to businesses of any size, from start-up to Fortune 500.

Sample: Policy and legislation - European and international

This section provides more highlights information on these planning policies and legislation in the United Kingdom (UK) and European Union (EU) energy systems and how they relate to renewable energy developments, with the focus on the planning systems, and for which Nigeria and ECOWAS can emulate.

There are a number of policies and legislative documents that exist at the European level and may be relevant to renewable energy developments in the UK. These include 'Directives' (particularly related to habitat management and conservation), 'Conventions' and 'Schemes'. These EU policies may be implemented through statutory regulations in member countries. This section provides an overview of different EU legislation of potential relevance to renewable energy developments that includes:

- Biomass action plan (Europe)
- Council directive on the conservation of wild birds
- Council directive: Habitats directive
- Energy performance of buildings directive
- European Union greenhouse gas emission trading scheme (EU ETS)
- Kyoto Protocol to the United Nations framework convention on climate change
- Special protection areas (SPAs)
- The convention on the conservation of European wildlife and natural habitats (the Bern Convention)
- The energy performance of buildings directive: A summary of its objectives and contents
- Copenhagen 2009

[45] Wikipedia.

The Commission's detailed analysis of cost-effective ways of reducing greenhouse gas emissions (GHG) by 2050 has produced a number of important findings[46].
In order to be in line with the 80% to 95% overall GHG reduction objective by 2050, the Roadmap indicates that a cost effective and gradual transition would require a 40% domestic reduction of greenhouse gas emissions compared to 1990 level as a milestone for 2030, and 80% for 2050 and outlines sectoral targets as follows:

Table 4: EU's Sectoral GHG reductions targets by period:

GHG reductions levels compared to 1990 (base year)	**2005**	**2030**	**2050**	
GRAND TOTAL	-7%	-40 to -44%	-79 to -82%	
SECTORS:				
Power (CO2)	-7%	-54 to -68%	-93 to -99%	
Industry (CO2)	-20%	-34 to -40%	-34 to -40%	
Transport (incl. CO2 aviation, excl. maritime	+30%	+20 to -9%	-54 to -67%	
Residential and services (CO2)	-12%	-37 to -53%	-88 to-91%	
Agriculture (non-CO2)	-20%	-36 to -37%	-42 to -49%	
Other non-CO2 emissions	-30%	-72 to -73%	-70 to -78%	

For Nigeria these changes will achieve the following:

a) Develop the domestic energy market faster;
b) Integrate energy supply sources effectively;
c) Harmonise the use of gas resources and stop flaring and link gas management to power-electricity growth and development;
d) Introduce green energy supply effectively to penetrate energy supply mix and distribution;
e) To identify the point at which the natural petroleum resources and other sources decline and is overtaken by a green supply source;
and
f) Streamline governance, people involved in regulation-as it is, there are more regulators than businesses in the energy sector.

8.7.3 RECOMMENDATION 4:
The Recommended Role of Government in business, Governance & Corruption mitigation and Education Policy

The public institutions are weak and lack institutional capacity, even the little effort is ridden with *primitive accumulation of wealth* through collection of bribes, contract inflations and foreign investors and business travellers are sometimes welcomed with a speech at ports of entry or departure; "Oga",what have you got for us"?! Of course there are exceptions, as only a few present this poor image and the government has been hard on such miscreants.

[46] Communication from The Commission to The European Parliament - Brussels, 8.3.2011

Transparency international ranks Nigeria as one of the worst countries to do business in. Many of the 'rulers' and the 'governed' are all the same on this page on corruption; the former use petrodollars to buy and influence votes, manage their winning political parties, appoint the Local Government and National Assembly members, influence hero worshippers with contracts and high positions in government, all of which prevents the formation of opposition and creates a band wagon effect of most citizens chasing attention of the rulers to enjoy some palliatives.

In January 2012 the Nigerian President Goodluck Jonathan suspended a nationwide fuel subsidy, sparking protests after the price of gasoline more than doubled. It became a rallying point for Nigerians angry over corruption and the alleged misuse of oil revenues in a country where most citizens battle grinding poverty. The Probe being conducted by Nigeria's National Assembly (NASS) has unearthed large scale fraudulent malpractices by government agencies and traders who make claims in the name of Petroleum subsidies. "The government is probably paying more than 2 trillion naira ($12.6 billion) to fuel importers to cover the difference between market costs and state-regulated prices for last year", said Farouk Lawan, Chairman of a House of Representatives committee investigating the discrepancies. Information available indicates that is up from 384 billion naira in 2009 and represents almost half of last year's 4.5 trillion budget. "This is the single largest fraud that has ever been disclosed in Nigeria's political history," Clement Nwankwo, executive director of the Abuja-based Policy and Legal Advocacy Centre.[47]
There is hardly any other sector institution that the story line is not the same, including private sector-run businesses, like the obnoxious bank scandals unearthed by the present government.

Education:
The data and reports show that Nigeria's education is in trouble, in terms of quality of school infrastructure, admission processes, funding, discipline and corruption, governance systems, poor curricula and ultimately the output of skills generated/produced is very low. According to NAPE; "the graduates of today's Geoscience Departments lack many basic skills when compared to those who graduates some 20 years ago",[48]
The government owned institutions are the worst in all of these indices. There is capital flight with increasing number of students going abroad, aided by foreign universities/colleges intensifying advertisement and selling admissions forms and recruiting students, locally.
The Nigerian Association of Petroleum Explorationists (NAPE) following a conference on University Assistance in February 2006, recommended amongst others, the following;

a. That the post –UME admission should ensure quality screening at admission point into universities; and number of those admitted should match the facilities in place;
b. Need to improve quality of pre-tertiary level education in materials, teaching etc.; and
c. Adequate funding by government for facilities, academic staff salaries and training.

The Government that owns majority of institutions needs to replace the current design to support new technology applications.

[47] elombah.com
[48] NAPE News, 2006

8.7.4 <u>RECOMMENDATION 5:</u> Community peace & stake in natural resources/mining industry

These matters have resulted in the escalation of the quest for "resource control"- the question is whether mineral resources should not belong to the communities that own the land. I would subscribe to the advocacy that a substantial share of the economic rent should be derived by mineral, natural resource localities through a more transparent allocation, using the global practice of "Royalty" rent. ROYALTY is an agreed percentage of the value of the gross petroleum produced and sold or removed from the property and range between deep water at 0% to land at 20% in Nigeria on petroleum operation, depending on terrain, with land to shallow waters between 16.75%-20% average. Royalties represents the most important 'Government Take' (share or economic rent) from the Concession Agreement since it is on gross basis and defines, relationship between mineral owner and explorer/producer as a concept of compensation for the destruction of the endowed land. *The endowed lands are in the communities*. Royalties are usually applicable and common to mining industry therefore.

I have in my years of career in industry been an advocate to utilize what in economics, is the suitable compensation for destruction of or reduction of its usable value of land from exploitation and production, hence I wish to recommend this structure where mineral communities largely on land and shallow waters, are to *negotiate and earn part of the Royalty rent of between 16.75-20%* other than 13% Derivation; 3% NDDC and another recent glamour for "10% Community Fund" from Profits of oil companies in the proposed 2009 PIB. These monies amount to millions of USD expended in Niger Delta but are poorly accounted for, lack controls and have not impacted on the people. The recent case in the U.K of the former Governor of Delta State is a case of personal aggrandisement against the State. These allocations are also raising the debate, whether it fair and just for some few states to "squander" these resources as some earn 20 times more than some poor states-creating deeper disparity in national growth patterns.

Royalty has direct assessment to volume of crude oil and gas produced and by which community-the activities of winning petroleum or minerals from the land. Government should continue to earn what is due, Taxes from such operation, which constitutes the greatest share of economic rent. This policy shall also be applicable to other mineral resources-solid minerals. This system is more transparent, auditable by all stakeholders involved on the chain. It also meets the standard global practices found in other countries.

This is against the backdrop of agitations which led to the creation of the Niger Delta Technical Committee (NDTC); a "45-member committee set up by President Umaru Yar'Adua of Nigeria on September 5, 2008 to review and distill all previous reports on the Niger Delta and come up with appropriate recommendations on the way forward for the region." In inaugurating them on the President's behalf, the then vice-president Goodluck Jonathan, also charged them to 'ferret out' solutions to the Nigeria Delta problem. Now, the committee has "ferreted" out 50% resource control starting with 25% and the balance met in the next few years, which is unlikely anticipated by the presidency.

Also, the plan to pay oil revenue derivation directly to oil producing communities to be managed by the communities' traditional rulers, elders and youths is said to be aimed at putting a permanent end to the restiveness in the region. This proposal is begging the issue because lack of accountability at all levels does not preclude traditional rulers, who are also known to have embezzled funds provided by some oil companies in consolation for their culpable drilling activities.

Fiscal Revenue sharing formula by the 3-Tier:

Furthermore, in 2008, the Revenue Mobilisation, Allocation and Fiscal Commission (RMAFC) was pressing hard for the passage of the Bill for a new revenue sharing formula among the three tiers of government. It proposed 53.69 per cent for the Federal Government, 31.10 percent for the states and 15.21 per cent for local government. A major feature of the bill is the proposal to pay oil revenue derivation directly to oil producing communities.

This is to replace the formula which is a product of an Executive Order of former President Olusegun Obasanjo, via a FMF ministerial circular, has been in place since March 2003 that yielded the formula: Federal Government 52.68 per cent; states 26.72 per cent; and local governments 20. 60 percent.

The 1992 recommendation which was used before 1999 is: FG 48.5 percent; states 24 percent; LGs 20 percent and Special fund 7.5 percent (distributed to: FCT 1 percent, Ecology 2 per cent, Stabilisation 1.5 per cent and Natural Resources 3 percent). That Order gave effectively, FG a whopping 56 per cent, states 24 per cent and LGs 20 per cent.

"full federalism"

In more recent times, there is growing quest for "full federalism" so that parts of the country can take a direct charge of their development agenda under current Nigeria's security tension, escalated by activities of insurgents (boko haram et al and renewal of Niger Delta crises).

It is our submission, that the growing poverty has beclouded the minds of the proponents and they fail to see the value of inter dependencies between diversities of economic natural resource endowments across the country and role of diversity in economic development history. Similarly, the insurgents appear to be those who have lost hope/have been disappointed by succeeding governments that failed to account for the barest and basic needs of her citizens and fail to see their contributory value to society. If only we have electricity!

It is recommended that the center (FGN), the executive should be weaker and leaner and revenue allocation in tandem with greater responsibility to the States and Local Governments, where majority of population are. There should also be a system that drives the State governments to be self-reliant instead of the dependency on the center for revenue. This should be carried out in the light of viability and rationalization of the States, as the case maybe, in terms of size, Nigeria with has with 36 States plus FCT, 37, is akin to the geographic size of the State of Texas. Texas in the USA whose grid operator agency is The Electric Reliability Council of Texas (ERCOT), expects

to have 73,300 MW of available generation in 2012 plan with little change from the year before[49]. Nigeria by population, it is akin to Brazil that has about 177 million population with 6 provinces. The Brazilian Electric System predominance is of hydropower- the main feature of the electric system. Hydropower plants amount to almost 80% of the installed capacity (101 GW). As many hydro plants share the same river basin most of the decisions are interdependent. The quest for more states in the Federation is not a solution to a sustainable economy.

8.7.5 RECOMMENDATION 6: Role of Government should be as Regulator & Need for Privatisation

Privitisation simply means the transfer of management of assets, resources from the public to private sector. This also transfers sources of capital for business growth. In the earlier sections of this paper, it is reported that at the moment the government pays its 57% equity share of joint venture cashcalls to the upstream for joint ventures budgets and currently contributes between $4-$5 Billion dollars annually and in addition, provides budgets to the NNPC's capital costs and major operational activities, such as TAM; by so doing it acts as an "investor". In combination of the two, the government expends about $6-$8 Billion on capital activities per year. The capital required comes mainly from directly earned current revenues and this is the primary source of capital to the industry with limited debt financing of projects from multi- lateral and debt financing on some few projects. This constrained source of capital has limitations and also adds pressure on national budgets as other sectors/ activities compete for allocation of funds. This has had a direct impact of limiting the growth of the petroleum sector and limited the expansion of infrastructure. The urgent need to privatise the petroleum sector is yesterday and not now to free money to run government and unlock the potential of the sector. It goes without saying that the constraints on adequate payment of cashcall and delays in payments, government bureaucracy to approve budgets, low levels of authority for expenditure, political and government interferences will disappear sooner and a greater focus will be given to fiscal discipline and improvements on tax collection.

Privitisation processes and abuses have been a source of disappointment so far in Nigeria, also ridden with corruption, but the system still has a way of correcting itself as there are show-cases of privitisation success in telecommunication and aviation industry. Controversies have attended many of privitised companies and the exercises conducted by Bureau for Public enterprises (BPE) and authority of the National Council on Privitisation have been questioned, and some of the sales have been revoked by subsequent governments-whether the requirements of core investors having technical, financial and managerial acumen or partisan interests arise continuously.

A true and effective transformation of the management of the natural petroleum resource sector to drive growth in energy supply mainly from green sources, improve productivity capacity from increased manufacturing, will serve to drive down poverty and to develop a more inclusive, fair

[49] Reuters, Houston, March 1, 2012.

and just society, since government revenues will shore up to put in place suitable social benefit schemes for the least poor.

8.7.6 RECOMMENDATION 7: Funding RE

At the sixteenth session of the Conference of the Parties (COP) of the UNFCCC held in Cancun, Mexico, the COP adopted, as part of the Cancun Agreements, decision 1/CP.16 to establish the Green Climate Fund (GCF). The GCF was conceived as the main multilateral financing mechanism to support climate action in developing countries at the Copenhagen COP in 2009, as parties pledged to mobilize $100 billion in long-term financing per year by 2020.

A similar RE fund should be set up to replace the newly created Subsidy Reinvestment and Empowerment Programme (SURE-P), a committee set up to monitor the use of the subsidy removal accruing from higher sales prices. The Chairman of the committee, Dr. Christopher Kolade said recently to the media, that the saving from the partial petroleum subsidy removal is to benefit Nigerians, especially those in the rural areas, that there has to be a partnership between the federal, state and local governments in the use of the funds. The FGN share of the partial subsidy in January is reported to be about N15 billon, which is 47% of the 3-tier distribution for which the committee is responsible for.
The SURE-P plans appear to duplicate the functions of existing government public institutions such as to build roads, schools and so on.
It is being suggested here that to provide RE, is more sustainable and is the way to go. Additionally the CBN should also create an RE intervention fund. This proposal should be taken up seriously with government. The deepening of funding should come from, carbon markets, development agencies as well as from the private finance institutions, under given fiscal incentives for RE development.

Sample: Creation of a Domestic Carbon Market -The State Environmental Investment Agency of Ukraine[50],

The Ukrainian ecological (Green) investment scheme (GIS) was established in 2010 and currently has 62 GIS projects at implementation stage, 593 projects were considered and agreed by buyers of Ukrainian GHG emission quotas as at November 2011. Under the GIS, the government firstly receives funds and then directs them to financing of emission reduction projects, while the buyer receives the set amount of the approved volume of assigned units (quotas for GHG emissions). Ukraine is also has and is setting up international mechanism to have access to advanced green technologies. In addition cooperates with USAID, UNDP, and their own Federal Ministry of Environment (FME), Nature Conservation and the Nuclear Safety of Germany.
The National Environment Investment Agency established by Decree of the cabinet ministers hitherto (2005) was re-organised into the State Environmental Investment Agency (SEIA), dated 13.04.2011, to provide;

[50] Information from www.seia.gov.ua

- country-wide coordination and execute the provisions of the UNFCCC and Kyoto Protocol fulfillment;
- to realize the state policy in the field of regulation of anthropogenic negative impact on climate change and adaptation to its negative impact; and
- to create and support the national system of turnover and trading of carbon units.

8.7.7 RECOMMENDATION 8: Transition steps for Nigeria from "Fossil fuel to Green Energy Economy".

This transition plan recommended is not fool-proof and is a simple guide, aimed at showing possible steps and areas of integration that will enhance a low carbon green economy based on review of references of international 'best practice' and events around the globe in energy and renewable related legislations and organisation, fiscal policies, technology, financing and markets.

Table 5.

Stages/Concurrent	Recommendation Strategy	Desired Impact
Step 1	Immediate to short term: • Create the Nigeria Federal Energy Commission (NFERC), by appointment of an independent body of commissioners; out of existing regulators that reports to the Ministry of Energy. • Establish integrated energy planning for demand and supplies; R&D centers. • Fed Ministry of Environment (FME), OR a suitable agency is to establish measuring standards of GHG and reporting plus emission targets and also for each sector target. FME/Agency is to utilize existing donor technical supports from international agencies such as EU's Global Climate Change Alliance, HBS, DFID etc, to design and implement policies. • Roll-out integrated energy policies, fiscal policies and incentives for RE for Nigeria in tandem with oil and gas. • Conclude privatization plans of key sectors of energy; power & petroleum • Embark on mass education of public/civil society on Climate Change- de-forestation/flooding. • Adopt adaptation programs at national level to local levels as well as at regional level.	Reduce poverty impact & Reduce de-forestation and flooding. Reduce use of combustible waste-especially firewood, cut down gas flaring etc

Stages/Concurrent	Recommendation Strategy	Desired Impact
	• Implement/support regional strategies on climate observation on CC- measurement, impact, vulnerability and adaptation strategies. - Re-plantations of forest & other mitigations strategies - Speed up and increase biomass renewable energy to produce ethanol etc. besides the added food values development; and integrate farmer's effort with RET. - Provision of alternative cooking methods; e.g. the cook stoves project, expansion of LPG etc. - Expand use of gas (CNG) & biomass fuel alternative for public transports. - Utilize carbon capture and storage (CCS) technologies to the fossil fuel usage in fuel transformation, industry and power generation, to cut down CO2 emissions. - embark on energy efficiency plans and programmes at all levels – e.g. change incandescent light bulbs; and introduce control systems that monitor peak demand and consumption in operations of electricity supply; reassess building codes at national level and labeling. • Train skills for RE development in R&D and RET by re-assessing PTDF programmes and Ministry of Education curriculum.	
Step 2	Short to medium term: • Revise the weak elements in existing contracts and Joint Operating Agreements and Production Sharing Contracts with IOCs in the light of new energy sector management. • Strengthen national R & D studies in RE and oil and gas reservoir management and planning (now under the control of IOCs for	Increase gas a major available & cleaner resource to supply for energy consumption. Accelerate the harnessing of the Associated Gas (AG) for domestic use.

Stages/Concurrent	Recommendation Strategy	Desired Impact
	their export use). • Manage waste from landfills and incineration; waste transport efficiencies; waste prevention. • Implement new housing policy & design to target solar use. • Accelerate the Gas flare reduction plans, develop the gas corridor grid and put in place the major Gas Pipeline network across the county or as conceived in the Gas Master Plan (GMP), similar to WAPCO. • With or without PIB, implement immediately the policy of open access to gas ownership, pipeline transmission and distribution. • Subsidy on petrol and gas should be tied to the power MYTO system-an integrated approach.	
Step 3	Medium-Long term: • Increase spread & Intensity of RE energy technologies by having access to intellectual property and own R & D. • Create an environment (green) fund and create a domestic carbon market.	• To replace fossil fuel with renewable energy by a minimum of 60%.

By so doing the current electricity National Grid Capacity of about 6,000MW, which is built around gas 37%, oil 32% and hydro 31% can scale-up to 200,000MW by the targeted 2030 full MDG national requirement, in the new proposed ratio of Renewable sources plus Hydro-60%, Gas-30% and remaining 10% from oil products and others, thus introducing a strong irreversible green economy. This ratio also takes account of the dynamics in population growth of 250 million by 2025 and a greater deployment of RE in rural populations.