



This project is funded
by the European Union



Nigeria energy sector under the universal principles of the Energy Charter

DRAFT

Brussels, May 2015

Energy Charter Secretariat

Pre-Assessment Report of the Nigerian Energy Sector under the Principles of the International Energy Charter and the Energy Charter Treaty¹

Brussels

May 2015

¹ This publication has been produced with the assistance of the European Union. The contents of this publication are the sole responsibility of the author and can in no way be taken to reflect the views of the European Union.

The contents of this work do not necessarily represent the views of the Energy Charter Secretariat or any members of the Energy charter Treaty nor those of the Government of Nigeria.

This Report was drafted by Uwakwe Ukuta Azikiwe (Nigerian Electricity Regulatory Commission). The research work was guided by Ernesto Bonafé (Energy Charter Secretariat).

Table of Contents

Executive Summary	6
1. Introduction.....	8
2. Country Profile.....	10
2.1. General Features	10
2.2. The Economy	12
2.3. Administration of the Energy Sector	14
2.3.1. The Presidency	14
2.3.2. Federal Ministry of Petroleum Resources (FMoPR)	16
2.3.3. The Federal Ministry of Power (FMoP).....	21
2.3.4. Federal Ministry of Mines and Solid Minerals	22
2.3.5. Federal Ministry of Environment (FMoE)	23
2.3.6. Federal Ministry of Water Resources (FMoWR).....	23
2.3.7. Federal Ministry of Trade and Investments	25
2.3.8. Nigerian Electricity Regulatory Commission (NERC)	28
2.3.9. National Inland Waterways Authority (NIWA).....	29
2.3.10. The Nigerian Bulk Electricity Trading Co. (NBET).....	30
2.3.11. The Niger Delta Power Holding Company Limited (NDPHC)	30
3. National energy sovereignty	32
3.1 National energy sovereignty as a universal principle	32
3.2 Nigerian Constitution.....	32
3.3. Reforms in the Energy Sector	34
3.3.1. Power Sector Reform.....	34
3.3.2. Reform of the Oil and Gas Sector	35
3.4. National strategy	36
3.4.1. General Energy Policies.....	36
3.4.2. Electricity Sector.....	38
3.4.3. Oil & Gas	39
3.4.4. Renewable Energy	40
3.4.5. Rural Electrification.....	41
4. Energy Security.....	41
4.1 Energy security as a universal principle	41
4.2 Energy security in Nigeria	42

4.3. Energy consumption and production	45
5. Open Markets and technological transfer	46
5.1 Open energy markets and technological transfer as a universal principle	46
5.2 Open energy markets	47
5.2.1 Hydrocarbons.....	48
5.2.2. Natural Gas	54
5.2.3. Coal Energy	59
5.2.4. Electricity	63
5.2.5. Nuclear energy	74
6. Sustainable energy	75
6.1. Sustainable energy as a universal principle	76
6.2.1 Renewable energy sources	76
7. Regional and International Frameworks	85
7.1. Regional integration as universal principle.....	85
7.2. Nigeria regional leader and committed partner.....	85
7.2.1. Regional integration.....	85
7.2.2. Joint Development with Sao Tome and Principe	86
7.2.3. West African Gas Pipeline (WAGP).....	87
7.2.4. The Proposed Trans-Saharan Gas Pipeline (NIGAL Project).....	90
7.2.5. The West African Power Pool	91
7.3. International cooperation as universal principle	93
7.4 Nigerian international commitments.....	93
7.4.1. Investment Agreements & Related Instruments	93
7.4.2. International Initiatives for Investments in the Power Sector	94
7.4.3. International Assistance for the Reform Programme	97
8. Investment protection.....	100
8.1 Investment protection as universal principle.....	100
8.2 Nigerian experience and commitment on investment protection.....	100
8.3. Incentives for Investors in Nigeria.....	101
9. Added Value of Acceding to the International Energy Charter and Energy Charter Treaty	104
9.1. At political level.....	104
9.1.1. Political signal of the country to international community	104
9.1.2 Effects of modernization of the Energy Charter Process	104
9.2. At strategic level	105

9.2.1. Promotion of energy investments and trade.....	105
9.2.2. Engagement in multilateral cooperation and good governance	105
9.2.3. Influential and confident position within the Energy Charter Process.....	106
9.3. At practical level	106
9.3.1 Observer status with the Energy Charter Conference	106
9.3.2. Getting familiar with the Energy Charter Treaty	106
9.3.3. Possibility to initiate the Early Warning Mechanism	107
10. Conclusions and recommendations.....	108
10.1. Challenges.....	108
10.2. Open issues	109
10.3. Recommendations.....	109
10.4. Procedure to adopt the International Energy Charter.....	112
Bibliography	113

Executive Summary

The Energy Charter is an international organization that promotes the rule of law and regulatory stability for investment, trade, transit and efficiency in the energy sector across the world. As part of the objective to expand its principles and rules beyond its traditional borders, the Energy Charter has updated the 1991 European Energy Charter into the 2015 International Energy Charter in order to reflect some of the most topical energy challenges of the 21st century. These challenges include the energy “Trilemma,” between energy security, economic development and environmental protection, the need to promote access to modern energy services, diversification of energy sources and routes, regional integration of energy markets and the growing importance of developing and emerging countries in the global energy mix.

The International Energy Charter is in line with the EU and international policy agenda as reflected in the UN Sustainable Energy for All (UNSE4All) initiative, which mandates a 3-goal target of ensuring universal access, doubling the share of renewable energy and doubling the rate of improvement in energy efficiency by 2024. The European Union has allocated more than €3 billion over the next seven years (2014-2020) to promote sustainable energy in Sub-Saharan Africa. The importance of these efforts has been reinforced by the 2014 G7 and G20 meetings in Brussels and Brisbane, respectively, which highlighted the need to provide strategic assistance for sustainable socio-economic growth and financial rebalancing in developing and emerging countries.

In this context, the Energy Charter Secretariat, in collaboration with the European Commission, has developed a capacity building programme with African countries to introduce them to the universal market-based principles enshrined in the International Energy Charter and the Energy Charter Treaty and to assess their energy sectors against these universal principles. The objective is to promote an investment-friendly regulatory environment that is needed to address the huge energy challenges facing the African continent. This Report is the result of that capacity building programme, which brings secondees from African countries to the Secretariat in Brussels for three months.

This report provides an overview of the Nigerian energy sector, and presents national reforms against the core principles embodied in the International Energy Charter and the Energy

Charter Treaty: Security of supply and universal energy access, open and sustainable markets, national sovereignty, regional market integration, regulatory stability and predictability, research and technology transfer, and international cooperation. Accession to the International Energy Charter and the Energy Charter Treaty will contribute to upgrading the national energy policy and legal framework according to international standards. This will eliminate uncertainty and unpredictability, while improving trust and reliability in an increasingly global and interdependent energy sector. The more countries subscribe to those principles, the more they will effectively set the necessary standard for international energy relations.

1. Introduction

The Energy Charter Treaty is an international legally binding document providing clear and predictable rules in the areas of investments, trade and transit, and energy efficiency. It provides dispute resolution mechanisms, while explicitly recognising and protecting national sovereignty over natural resources. The Energy Charter Treaty creates an environment in which international energy markets can function effectively, helps to create a level international playing field, and promotes the rule of law in the energy sector. The Energy Charter Treaty was signed in 1994 and entered into force in 1998. It currently has been signed, or acceded to, by 54 countries, including the European Union.

The political foundation of the Energy Charter Treaty was the European Energy Charter of 1991, a political declaration expressing the commitment of a signatory country to move towards an upgraded international legal system. The European Energy Charter is a political commitment by its members to encourage energy cooperation with the following objectives and principles: development of open and efficient energy markets; creation of conditions to stimulate the flow of investment into the energy sector and encourage the participation of private enterprise; non-discrimination among participants; respect for state sovereignty over natural resources; and recognition of the importance of environmentally sound and energy efficient policies. To date, the European Energy Charter has been signed by sixty-four European, Asian, Australasia, North American and African states, as well as the European Union.

The Astana Declaration of November 2014 highlights the strategic objective of the Energy Charter to expand the principles of the Treaty beyond its traditional borders by maximising on the increasing interest of new countries in different continents/regions around the world. The adoption of the International Energy Charter in 2015 reflects the implementation of this objective.

Nigeria became an invited Observer by the Energy Charter Conference at its 12th meeting held on June 26, 2003 in Brussels.² Having Nigeria sign the International Energy Charter, and later the Energy Charter Treaty, sends a political signal to the international community that it

² Decision of the Energy Charter Conference (CCDEC 2003) Brussels, 26 June 2003 retrieved from <http://www.energycharter.org/fileadmin/DocumentsMedia/CCDECS/CCDEC200301.pdf>

shares a number of international energy principles on trade, investment, transit and energy efficiency. This will upgrade its national energy sector according to international principles, raise its investment profile, and help to attract the needed foreign investment.

The objective of this report is to present the Nigerian energy sector and compare it with the universal principles enshrined in the International Energy Charter and the Energy Charter Treaty. The conclusion is that Nigerian energy objectives and structural reforms match the principles of the International Energy Charter and therefore Nigeria should embrace it, and thereafter, the Energy Charter Treaty.

2. Country Profile

2.1. General Features

Figure 1: Map of The Federal Republic of Nigeria



Source: Ezilon Maps³

The Federal Republic of Nigeria gained its independence on October 1, 1960. It has 36 States and the Federal Capital Territory, Abuja, and is located in West Africa. Nigeria lies between latitude 10° North and longitude 8° East, and is bordered on the west by Republic of Benin, on the north by Niger and Chad Republics, on the east by Cameroon and on the South by the Gulf of Guinea in the Atlantic Ocean. The Rivers Niger and Benue merge to form a ‘Y’ shaped confluence at Lokoja, and divides the country into three major geographical sections, west, east and north as it flows southward through tropical rain forests and swamps to its delta in the Gulf of Guinea. The Niger Delta is one of the world’s largest accurate fan-shaped river deltas. Nigeria is covered by three types of vegetation, forest, savannahs, and montane land (found mostly in the mountains near the Cameroon border).

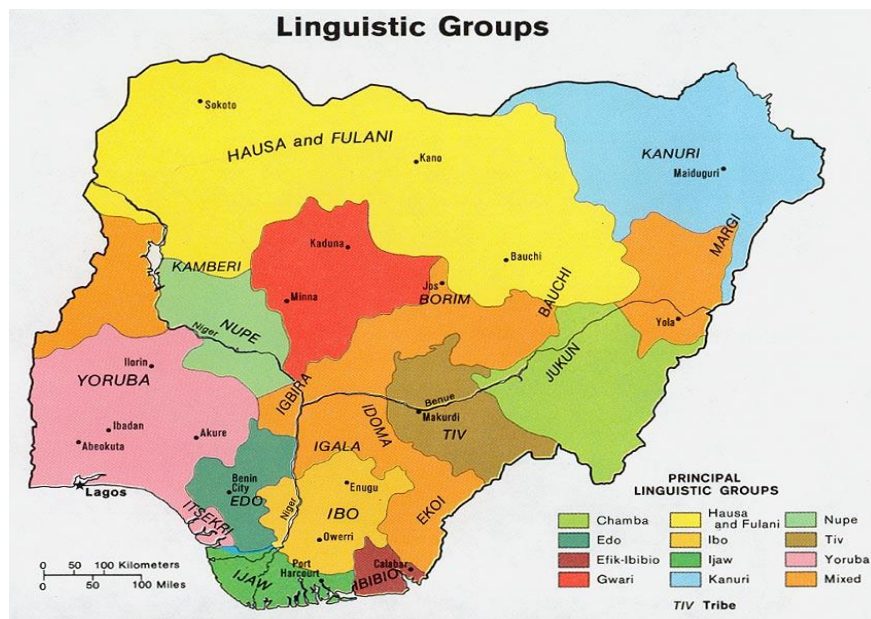
Nigeria is blessed with natural resources, e.g., natural gas, crude oil, tin, iron ore, coal, limestone, niobium, lead, zinc, and arable land. Agricultural products include cocoa, peanuts, cotton, palm oil, corn, rice, sorghum, millet, cassava (manioc, tapioca), yams, rubber, cattle,

³ Ezilon Maps. Retrieved from <http://www.ezilon.com/maps/africa/nigeria-maps.html>

sheep, goats, pigs, timber, and fish. Furthermore, industries include crude oil, coal, tin, columbite, rubber products, wood, hides and skins, textiles, cement and other construction materials, food products, footwear, chemicals, fertilizer, printing, ceramics, and steel. The climate in Nigeria is equatorial in the south, tropical in the centre, and arid in the north, and is characterized by high humidity and substantial rainfall. There are two seasons –wet and dry. The wet season lasts from April to October, while the dry season lasts from November through March.

Nigeria has a total area of 923,773 square km (made up of 909,890 square km of land area and 13,879 square km of water area) The longest distance from East to West is about 767km, and from North to South 1,605km. Nigeria is the most populous country in Africa and the eighth most populous in the world with a population estimated in July 2014 at 177.2 million (140.4 million after the last census exercise, in 2006) and a population growth rate of 2.47% per annum (33rd in the world).⁴

Figure 2: Linguistic Groups in Nigeria



Source: University of Texas⁵

The population is made up of 0-14 year olds (43.2%), 15-24 (19.3%), 25-54 (30.5%) 55-64 (3.9%), and 65 and over (3%), meaning that about 70% of Nigerians are below the age of 40.

⁴ CIA Factbook on Nigeria. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html>.

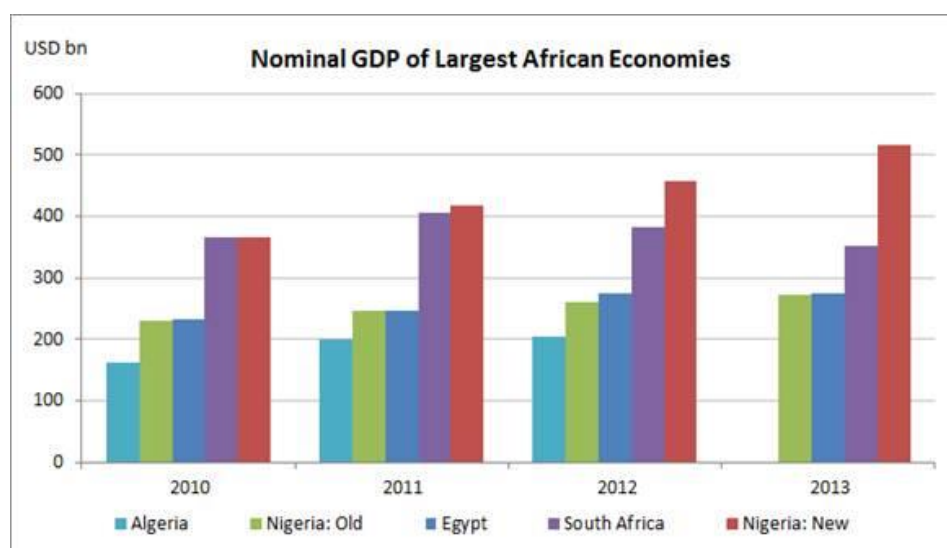
⁵ University of Texas. Retrieved from http://www.lib.utexas.edu/maps/africa/nigeria_linguistic_1979.jpg

Nigeria has between 250 and 400 ethnic groups with the Hausa and Fulani, Yoruba, Igbo (Ibo), Ijaw, Kanuri, Ibibio, and Tiv being the most populous and politically influential. The country is made up of Christians, Moslems, and people with indigenous beliefs. The official language is English, but about 400 different languages are spoken in Nigeria.

2.2. The Economy

The National Bureau of Statistics recently conducted a rebasing and re-benchmarking exercise of the national account series (GDP) from the first quarter of 2011 to the third quarter of 2014. The statistical exercise involved the replacing of the old base year used to compile volume measures of GDP (i.e., 1990) with a new and more recent base year (i.e., 2010). The next exercise will be done in 2016, in line with the UN Statistical Commission recommendation that such exercises be carried out every 5 years. Following the exercise, Nigeria emerged as Africa's largest economy with 2013 GDP (current) estimated at US \$521.8 billion, and the 26th largest economy in the world.⁶

Figure 3: Nominal GDP of Largest African Economies in 2013



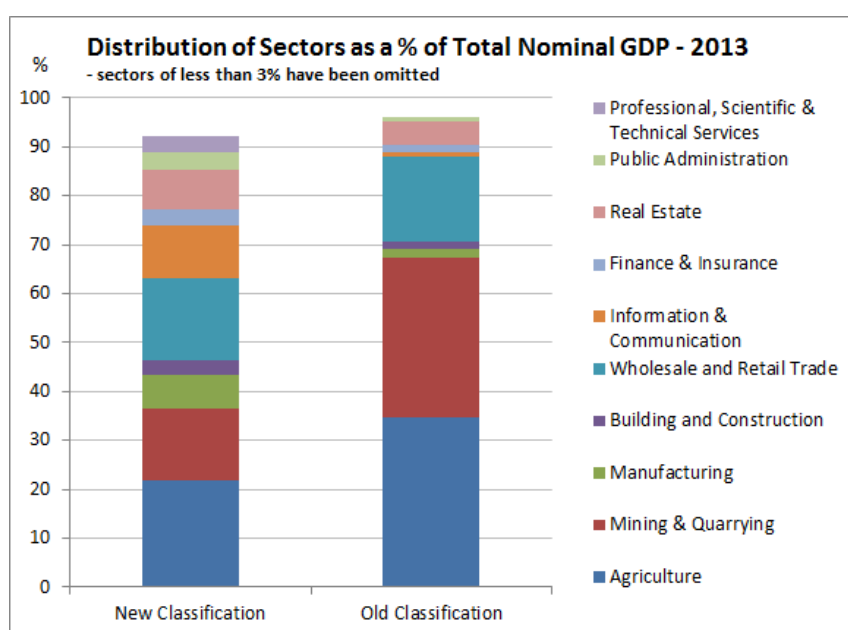
Source: CEIC Data⁷

⁶ World Bank Global Economic Prospects for Sub-Saharan Africa. Retrieved from http://www.worldbank.org/content/dam/Worldbank/GEP/GEP2014b/GEP2014b_SSA.pdf

⁷ CEIC, News Alert. Retrieved from <http://www.ceicdata.com/en/blog/ceic-newsalert-nigeria-becomes-largest-economy-africa-after-gdp-rebase>

The economy of the country in previous years and prior to the rebasing relied heavily on crude oil and gas, but since the rebasing heavily depends on agriculture, trade, information & communication, and crude oil and natural gas, which respectively account for 20.24%, 17.64%, 10.96%, and 10.80%, while Electricity, Gas, Steam, and Air Condition Supply contribute only 0.60%.⁸ Prior to the rebasing, the three sectors of agriculture, crude oil and gas, and trade accounted for 85% of GDP, but these sectors now cover only half, about 54%, of Nigerian output. Even though the share of oil and gas has been reduced, it still accounts for a strong majority of exports and budgetary revenues in the country, and is therefore critical to macroeconomic and budgetary stability. The real GDP growth rate is 5.49% for 2013 (estimated to be 6.23% in 2014), and the inflation rate for the same year stood at 8.50% (estimated to be 8.05% in 2014). The literacy rate is about 61.3% (2010 est.), life expectancy is 52.62 years (2014 est.), and unemployment rate is 23.9% (2011 est.).⁹

Figure 4: Distribution of Sectors a component of the Total Nominal GDP - 2013



Source: CEIC Data¹⁰

Nigeria's top trading partners include the US, India, France, South Africa, Netherlands, Spain, Brazil, Indonesia, China, the UK, Germany, Japan, South Korea, and Thailand. Capital

⁸ NBS Nigerian GDP Report, Quarter Four, 2014, Issue 04. Retrieved from <http://www.nigerianstat.gov.ng/pages/download/272>

⁹ CIA Factbook on Nigeria. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html>

¹⁰ CEIC, News Alert. Retrieved from <http://www.ceicdata.com/en/blog/ceic-newsalert-nigeria-becomes-largest-economy-africa-after-gdp-rebase>

importation into Nigeria has gone from US \$6 billion in 2010 to US \$21.3 billion in 2013, and at the end of the third quarter of 2014, capital importation into Nigeria stood at US \$16.3 billion.¹¹

2.3. Administration of the Energy Sector

The energy sector operates under various organizations which are mandated to develop policies and/or regulate activities affecting the different areas of the sector, or provide unique services required for the operation of the sector. They include the Presidency, Ministries, Regulatory bodies, Commissions, Authorities, Agencies, Offices, Bureaus, and Incorporated Companies.

2.3.1. The Presidency

The Presidency is headed by the President, whose chief duty is to make sure that the laws of Nigeria are executed. He performs these duties through executive agencies that include Federal Ministries headed by Ministers, and the Departments and Agencies headed by Chairmen, Director-Generals, Managing Directors, or Executive Secretaries. Some specific Departments and Agencies are under the supervision of the President, and have responsibilities related to the energy sector, such as The Presidential Task Force on Power (PTFP), the Bureau of Public Enterprise (BPE), The Energy Commission (ECN), the Nigerian Atomic Energy Commission (NAEC), and the National Energy Council.

The Presidential Task Force on Power (PTFP) was established in 2010 to drive the implementation of the reform of Nigeria's power sector as outlined in the Road Map for Power Sector Reform.¹² The PTFP co-ordinates the activities of several agencies that have specific contributions to the reform process such as the Federal Ministry of Power, the Federal Ministry of Finance, the Bureau of Public Enterprises (BPE), the Nigerian Electricity Regulatory Agency (NERC), the Nigerian National Petroleum Corporation (NNPC), the

¹¹ NBS Capital importation Summary Report 2007-2014. Retrieved from www.nigerianstat.gov.ng/pages/download/211

¹² PTFP. Retrieved from <http://www.nigeriapowerreform.org/content/Roadmap%20for%20Power%20Sector%20Reform%20-%20Revision%201.pdf>

Bureau of Public Procurement, and National Gas Company Limited (NGC). It also monitors the planning and execution of various short-term projects that are critical to meeting the milestones and targets in the Roadmap for the transformation of the power sector into a self-sustaining and largely privatised industry.¹³

The Bureau of Public Enterprise (BPE) is established to be the secretariat of the National Council on Privatisation (NCP) by the Public Enterprises (Privatisation and Commercialisation) Act Cap P.38 LFN (LFN) 2004 (the Act).¹⁴ The NCP formulates and approves policies on privatisation and commercialization of government-owned entities, while the BPE implements those policies. In addition, the BPE is responsible for preparation of public enterprises approved for privatisation and commercialization, advising on further public enterprises which may be privatised or commercialized, advising on the capital restructuring needs of Nigerian public enterprises to be privatized, and account management for all commercialised enterprises, etc. The BPE recently concluded unbundling and privatization of the generation and distribution companies owned by PHCN, in addition to the concession for the hydropower plants and executing a management agreement on behalf of the transmission licensee. Presently, the privatization of the generation projects under the NIPP is being finalized. A decision has not been made on the privatization of the refineries and other assets owned by the Federal Government.

The Energy Commission of Nigeria (ECN) was established by the Energy Commission of Nigeria Act 1979 as amended by the Energy Commission of Nigeria (Amendment) Acts 32 of 1988 and 19 of 1989,¹⁵ with responsibility for conducting strategic planning and coordination of national policies in the energy field, as well as preparing periodic master plans for the development of energy in Nigeria. It was established in line with the declaration of the Heads of The Economic Community of West African States (ECOWAS) in 1982 for the establishment of an Agency in each member state charged with the responsibility of coordinating and supervising all energy functions and activities. The functions of the ECN include the gathering and dissemination of information relating to national policy in the field of energy, advising on adequate funding of the energy sector, monitoring the performance of

¹³ PTFP. Retrieved from

http://www.nigeriapowerreform.org/index.php?option=com_content&view=article&id=76&Itemid=302

¹⁴ BPE. Retrieved from <http://www.bpeng.org/sites/bpe/Documents/BPE%20Act%201999.pdf>

¹⁵ Energy Commission of Nigeria.

http://www.energy.gov.ng/index.php?option=com_docman&task=doc_download&gid=71&Itemid=49

the energy sector in the execution of government policies, and providing solutions to technical problems that may arise in the implementation of any policy relating to the field of energy.

The Nigeria Atomic Energy Commission (NAEC) was established through the enactment of Act 46 of 1976¹⁶ as a specialised agency empowered and designated as the national agency vested with responsibility for the promotion and development of nuclear technology, and the implementation of the national nuclear power programme. It has the mandate to provide the pathway for the exploration and harnessing of atomic energy for application in the country according to the economic policies of Nigeria. In order to accomplish this, the Commission is responsible for research and development activities in nuclear technology, development and deployment of nuclear power plants, along with a manpower development programme.

The National Energy Council was inaugurated by the Federal Government to advise the President on long term and broad national objectives, and strategic policy directions for the oil and gas industry. The Council is also empowered to conduct periodic reviews of the National Oil and Gas Policy, Energy Master Plan, Strategic National Investments in the sector, and long term projects. The Council has also contributed in promoting energy cooperation with other countries, companies, international entities and investors through the Nigerian-German Energy Partnership, Nigeria-Brazil Energy Cooperation, General Electric-Nigeria Country to Company Energy Partnership, and the World Bank Energy Development Project Concept. These partnerships have leveraged expertise and comparative advantages to provide sustainable solutions to Nigeria's energy challenges.¹⁷

2.3.2. Federal Ministry of Petroleum Resources (FMoPR)

The Ministry of Petroleum Resources (FMoPR) has the mandate to initiate and supervise the implementation of government policies for the oil and gas sector. The Ministry is responsible for creating an internationally competitive oil and gas sector that contributes maximally to the growth and development of the Nigerian economy, as well as effective implementation of

¹⁶ FAO Legal. Retrieved from <http://faolex.fao.org/docs/texts/nig120577.doc>

¹⁷ NEC. Retrieved from <http://energycouncil.gov.ng/default.aspx>

policies on oil and gas exploration, exploitation and utilization in accordance with best international practice.

The Minister is empowered by the Petroleum Act No 51 of 1969¹⁸ to issue various licences for the exploration of petroleum, construction and operation of refineries, or for the storage, selling, or distribution of petroleum products. The Oil Exploration Licence (OEL) is a non-exclusive licence that only permits exploration for petroleum in an area. It is granted for one year and is renewable upon satisfaction of certain conditions.¹⁹ The Oil Prospecting Licence (OPL) grants the exclusive right to explore and prospect for petroleum, as well as carry away and dispose of petroleum won during prospecting operations, subject to fulfilment of certain obligations. The duration is determined by the Minister, but shall not exceed five (5) years for onshore areas and shallow waters,²⁰ and ten (10) years for Deep Offshore and Inland Basins.²¹ The Oil Mining Lease (OML) confers on the holder the exclusive right to search for, win, work, carry away and dispose of petroleum within an area for a period of 20 years. It is granted only to the holder of an OPL upon satisfaction of all conditions of the license and the Act, and oil in commercial quantity has been discovered, i.e., a flow rate of 10,000 bpd.²²

In addition, participatory rights are granted to contractors to conduct sole risk petroleum operations with respect to OMLs held by the NNPC.²³ Furthermore, abandoned or unproductive fields in lease areas covered by OMLs are farmed out to independent leaseholders and indigenous companies pursuant to the Guidelines for Farm-out and Operation of Marginal Fields 2011.²⁴ The Minister is also vested with the power to grant permits to survey routes for oil pipelines, and to grant licenses for the construction,

¹⁸ Petroleum Act. Retrieved from <http://www.lexadin.nl/wlg/legis/nofr/oeur/arch/nig/petroleumact.pdf>

¹⁹ Petroleum Act. Schedule One, Paragraph 1-4. Retrieved from <http://www.lexadin.nl/wlg/legis/nofr/oeur/arch/nig/petroleumact.pdf>

²⁰ Petroleum Act. Schedule One, Paragraph 5-7. Retrieved from <http://www.lexadin.nl/wlg/legis/nofr/oeur/arch/nig/petroleumact.pdf>

²¹ Deep Offshore and Inland Basins Production Sharing Contracts Act 1999, Section 2. International Centre for Nigerian Law . Retrieved from <http://www.nigeria-law.org/DeepOffshoreAndInlandBasinProductionSharingContractsDecree1999.htm>

²² Petroleum Act. Schedule One, Paragraph 8-13. Retrieved from <http://www.lexadin.nl/wlg/legis/nofr/oeur/arch/nig/petroleumact.pdf>

²³ Deep Offshore and Inland Basins Production Sharing Contracts Act 1999. Retrieved from <http://www.nigeria-law.org/DeepOffshoreAndInlandBasinProductionSharingContractsDecree1999.htm>

²⁴ Aina Blankson LP. Retrieved from <http://documents.mx/documents/marginal-fields.html>

maintenance and operation of oil pipelines pursuant to the provisions of the Oil Pipelines Act of 1990.²⁵

The holder of an OPL or OML may assign the interests to other persons, subject to the consent of the Minister.²⁶ In the PIB, a takeover, merger or acquisition shall be deemed as an assignment which shall require the Minister's consent. The Minister may decline the application for consent where he/she is not satisfied that the proposed assignee at least has the required technical and financial capacity to effectively carry out the obligations of the Licence.²⁷ Other than the foregoing, the Petroleum Act allows the government to acquire interests in any licence or lease upon paying adequate compensation to the licensee or leaseholder.²⁸ The major challenge with respect to the assignment of interest is a lack of clear guidelines for the exercise of the Minister's discretion, which has led to some measure of arbitrariness and uncertainty. A notable example of inadequate guidelines is the absence of any timelines for the exercise of the Minister's powers to grant consent or otherwise.

There are various agencies and parastatals under the supervision of the Ministry that ensure the implementation of approved policies for the sector. These include The Department of Petroleum Resources (DPR), the Nigerian National Petroleum Corporation (NNPC), Petroleum Products Pricing and Regulatory Agency (PPRA), the Nigerian Content Development and Monitoring Board (NCDMB), the Gas Aggregation Company Nigeria Limited (GACN), the Nigeria Nuclear Regulatory Authority (NNRA), and the Nigerian Gas Company (NGC).

The Department of Petroleum Resources (DPR) has the responsibility of ensuring compliance with laws, regulations and guidelines in the industry through monitoring operations where crude oil, natural gas, and petroleum products are explored, refined, stored, pumped, sold, and transported.²⁹ DPR supervises all petroleum industry operations, enforces safety and environmental regulations, keeps records on petroleum industry operations, advises

²⁵ International Center for Nigerian Law. Retrieved from <http://www.nigeria-law.org/Oil%20Pipelines%20Act.htm>

²⁶ First Schedule, Para. 14, Petroleum Act. Retrieved from <http://www.lexadin.nl/wlg/legis/nofr/oeur/arch/nig/petroleumact.pdf>

²⁷ Section 16, Petroleum Act. Retrieved from <http://www.lexadin.nl/wlg/legis/nofr/oeur/arch/nig/petroleumact.pdf>

²⁸ Para 35, First Schedule, Petroleum Act. Retrieved from <http://www.lexadin.nl/wlg/legis/nofr/oeur/arch/nig/petroleumact.pdf>

²⁹ DPR website. Retrieved from <https://dpr.gov.ng/index/about-dpr/functions-of-dpr/>

Government and relevant Agencies on technical matters and policies, processes applications for licenses, ensures timely and adequate payments of all rents and royalties, and monitors the implementation of the local content policy.

The Nigerian National Petroleum Corporation (NNPC) was established by the Nigerian National Petroleum Corporation Act No 33 of 1977 (now Cap N320 LFN 1999)³⁰ to undertake commercial ventures on behalf of the Federal Government in the petroleum industry. In addition to its exploration activities, the NNPC has powers and operational interests in refining, petrochemicals and products transportation, as well as marketing. In 1988, the NNPC was commercialised into 12 strategic business units, covering the entire spectrum of oil industry operations: exploration and production, gas development, refining, distribution, petrochemicals, engineering, and commercial investments. An oil marketing company seeking to market Nigerian crude must obtain a crude oil licence (COL) from the NNPC. The NNPC Guidelines for Lifting of Nigerian Crude 2003³¹ lays down the procedure and requirements for obtaining the licence, and shortlisted companies are considered on the basis of successful economic intelligence reports in respect of the requirements. Successful companies are granted the licence, and awarded a crude oil allocation contract that entitles them to lift crude, sell to refineries, refine for export or for sale in Nigeria. The price at which crude oil is sold in Nigeria is unregulated, but the NNPC is, however, responsible for setting the price for federal government crude. This price is known as the official selling price, and the Dated Brent-Forties-Oseburg-Ekofisk crude grade³² is used as a marker to determine the prices for the different grades of Nigerian crude.

The Petroleum Products Pricing and Regulatory Agency (PPRA) is an agency established by the Petroleum Products Pricing Regulatory Agency (Establishment) Act No 8 of 2003 (now Cap P43, Vol. 14, LFN 2004) to fix the benchmark prices of petroleum products, and also regulate and monitor the transportation and distribution of petroleum products in Nigeria. Its other functions include ensuring reasonable returns to operators, creating an information databank for decision-making, overseeing the implementation of the relevant recommendations and programmes in the White Paper on the Report of the Special Committee on the Review of the Petroleum Products Supply and Distribution, approving

³⁰ International Center for Nigerian Law. Retrieved from <http://www.nigeria-law.org/Nigerian%20National%20Petroleum%20Corporation%20Act.htm>

³¹ NNPC. Retrieved from <http://www.nnpcgroup.com/PublicRelations/bidininvite.aspx>

³² Platts. Retrieved from <http://www.platts.com/price-assessments/oil/dated-brent>

benchmark prices for products, preventing collusion and restrictive trade practices, and other necessary activities.³³

The Nigerian Content Development and Monitoring Board (NCDMB) was established by the Nigerian Oil and Gas Industry Content Development (NOGICD) Act of 2010. The NCDMB is responsible for supervising, coordinating, monitoring and managing the development of Nigerian content in the oil and gas sector in accordance with the requirements and prescriptions of the NCDA. The Board provides a framework for promoting participation of Nigerians in the oil and gas industry, and lays down minimum thresholds for Nigerian content utilised by the industry. Some of its responsibilities include increasing indigenous participation in the industry, building local capacity and competencies, creating linkages to other sectors of the national economy, and boosting industry contributions to the growth of GDP.

The Gas Aggregation Company Nigeria Limited (GACN) was incorporated in 2010 for the purpose of stimulating growth of natural gas utilization in the Nigerian domestic market. GACN was formed in line with statutory requirement of the National Domestic Gas Supply & Pricing Regulations of 2008 and is the vehicle for the implementation of the Nigerian Gas Master Plan (NGMP) commercial framework. The NGMP requires the establishment of the GACN, as the Strategic Aggregator for the domestic gas market responsible for processing requests from gas buyers, managing allocation of gas to buyers, facilitating negotiations for Gas Sale and Aggregation Agreement (GSAA), managing escrow accounts on behalf of gas sellers, and managing dispute resolution process for stakeholders.³⁴

The Nigeria Nuclear Regulatory Authority (NNRA) regulates and monitors all activities involving development and use of nuclear tools and radioactive materials. The Nuclear Safety and Radiation Protection Act 19 of 1995³⁵ establishes the Authority, and empowers it to regulate all nuclear activities and enforcing all nuclear laws and regulations in Nigeria. Its responsibilities include registering, licensing, inspecting and enforcing nuclear safety

³³ NASS. Retrieved from <http://www.nassnig.org/nass/legislation.php?id=1167>

³⁴ GACN. Retrieved from http://www.nigeriaelectricityprivatisation.com/wp-content/uploads/downloads/2011/02/Gas_Aggregation_Company_of_Nigeria_Investor_Forum_Presentation.pdf

³⁵ LawNigeria.com. Retrieved from <http://lawnigeria.com/LawsoftheFederation/NUCLEAR-SAFETY-AND-RADIATION-PROTECTION-ACT.html>

and radiological protection in all practices in the country and enabling Nigeria to meet its international obligations on the peaceful uses of nuclear technology.³⁶

The Nigerian Gas Company (NGC) is a subsidiary of the NNPC charged with the responsibility of serving Nigeria's energy needs through an integrated gas pipeline network, as well as exporting natural gas and its derivatives to customers in West African. The company was initially established to gather, treat, transmit and market Nigeria's natural gas and its by-products. Its business philosophy was later reviewed to focus only on transmission, distribution and marketing of natural gas. Furthermore, the NGC is expected to seek new gas marketing opportunities by executing new GTAs, GSAs and GPAs to supply customers, explore opportunities in the region, partner with other investors to develop and expand CNG & LPG business in Nigeria and the region, and invest in new distribution pipelines. NGC currently operates 12 gas supply systems comprising of 16 compressor stations, 18 metering stations, and over 1,250 km of pipelines (4" to 36" in diameter), with a capacity of more than 2.5 bscf of gas per day.³⁷

2.3.3. The Federal Ministry of Power (FMoP)

The Federal Ministry of Power has the overall responsibility of formulating electric power policy. The Ministry's powers are guided by the National Electric Power Policy (NEPP) of 2001, the Electric Power Sector Reform Act of 2005, and the Roadmap for Power Sector Reform of August 2010.³⁸ The NEPP is the national policy document for the power sector, the EPSR provides the legal framework, and the Roadmap is an implementation document for reforms in the sector. Entities under its supervision include the Rural Electrification Authority (REA) and Electricity Management Services Limited (EMSL).

The Rural Electrification Authority (REA) is established under the EPSR Act with the mandate to implement the Rural Electrification Strategy and Plan for Nigeria under the

³⁶ NNRA. Retrieved from http://www.nnra.gov.ng/page-about_us

³⁷ NNPC. Retrieved from <http://www.nnpccgroup.com/nnpcbusiness/subsidiaries/ngc.aspx>

³⁸ PTFP. Retrieved from <http://www.nigeriapowerreform.org/content/Roadmap%20for%20Power%20Sector%20Reform%20-%20Revision%201.pdf>

supervision of the Minister of Power.³⁹ The Rural Electrification Strategy and Plan covers expansion of the national grid to rural areas, the development of isolated and mini-grid systems all over the country, and the administration of the Rural Electrification Fund.

The Electricity Management Services Limited (EMSL) is established by the Federal Government to take over the responsibilities of some non-core operational and subsidiary assets of the defunct PHCN, with the mandate to provide ancillary and support services to the electricity generation, transmission, distribution segments of the power sector, end-user consumers and other related businesses. Their responsibilities include carrying out inspections, tests and certification of equipment; providing data, information, and library services; maintenance, repairs, and re-conditioning of transformers; printing security and non-security documents; operating the National Meter Test Stations in Nigeria; and providing storage facilities for operators.

2.3.4. Federal Ministry of Mines and Solid Minerals

This ministry was established in 1985 to encourage development of the country's solid mineral resources. It formulates policies, provides information on mining potential and production, and regulates operations of operators. The Mining and Mineral Act of 2007⁴⁰ clearly defines the Government's role as a regulator, facilitator and supervisor of activities in the sector.

The Mining Cadastre Office (MCO) is established by the Act as an autonomous body responsible for granting and managing of mining titles/rights, protection of rights of investors, monitoring and administration of mining title/rights, and use of time limits for granting titles. In order to allow the private sector to take a pivotal role in the growth of the sector, the MCO was created for a stable regulatory, economic and political environment which will encourage foreign investors to make long-term commitments to exploration and mine development in Nigeria.

³⁹ Electric Power Sector Reform Act No 6 of 2005 Cap. E7 LFN 2004, Section 88. Retrieved from <http://www.placng.org/new/laws/E7.pdf>

⁴⁰ MCO. Retrieved from <http://www.miningcadastre.gov.ng/pages/pub/pdf/Nigeria%20Minerals%20and%20Mining%20Act%202007.pdf>

2.3.5. Federal Ministry of Environment (FMoE)

The Federal Ministry of Environment was established by a Presidential approval in June 1999 to ensure effective coordination of all environmental matters which hitherto were fragmented and resident in other Ministries. Subsequently, the Environmental Impact Assessment (EIA) Act No. 86 of 1992 Cap E12, LFN 2004⁴¹ was enacted, requiring any person planning a project/activity which may have an impact on the environment to conduct an EIA study and submit a Report for approval and issuance of a Certificate. The Report shall also set out the plans for preventing and mitigating such impacts, as well as clean-up plans where necessary. The Schedule to the Act lists industries for which such studies are mandatory, and includes some activities in Mining, Petroleum, Power Generation and Transmission, and Quarries. The regulatory body responsible for enforcement of environment laws is the National Environmental Standards and Regulations Enforcement Agency (NESREA).

The National Environmental Standards and Regulations Enforcement Agency (NESREA) was established by the NESREA Act of 30 July, 2007⁴² to enforce all environmental laws, guidelines, policies, standards and regulations in Nigeria. It also has the responsibility to enforce compliance with international agreements, protocols, conventions and treaties related to the environment.⁴³ The Federal Court of Appeals in Nigeria recently held that “...NESREA...is the statutory body established by the National Assembly to replace Federal Environmental Protection Agency (FEPA)... It is therefore the body that is vested with powers to issue Environmental Impact Assessment Certificates”.⁴⁴

2.3.6. Federal Ministry of Water Resources (FMoWR)

In April 2010 the FMoWR was separated from the Ministry of Agriculture with the responsibility of managing the nation’s water resources. Its mandate includes formulation and implementation of Water Resources Policies and Programmes, coordination of hydro-meteorological and hydrological data, monitoring and evaluation of water projects and

⁴¹ International Center for Nigerian Law. Retrieved from <http://www.nigeria-law.org/Environmental%20Impact%20Assessment%20Decree%20No.%2086%201992.htm>

⁴² FAO Legal Office. Retrieved from <http://faolex.fao.org/docs/pdf/nig120569.pdf>

⁴³ NESREA. Retrieved from <http://www.nesrea.org/about.php>

⁴⁴ Guardian Newspaper of February 22, 2015. Retrieved from <http://www.ngrguardiannews.com/2015/02/court-bars-states-on-issuance-of-eia-approval-certificate/>

programmes for effective performance, formulation and review of national water legislation, and liaison with relevant agencies on matters relating to water resources development. The Ministry engages in the construction, operation and maintenance of dams nationwide for water supply, hydro power, irrigation, fishery development, flood control, tourism and recreation. The entities under its supervision include the River Basin Authorities and the Nigerian Integrated Water Resources Commission (NIWRC).

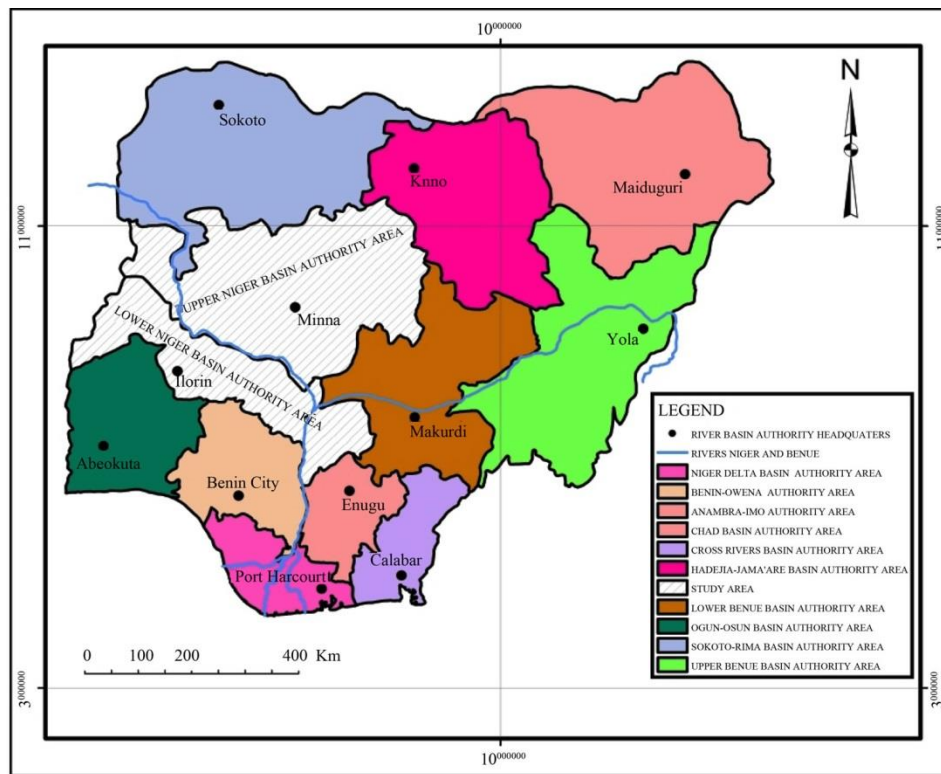
The Nigerian Integrated Water Resources Commission (NIWRC) was created by the NIWRC Act to regulate and manage water resources all over the country, and other related matters. The Act also gives it responsibility for the economic and technical regulations of all aspect of water resources, namely including exploitation and commission, construction, operation and maintenance, and tariffs of public and private water resource infrastructure. The Commission was created for proper management and conservation of the resources as the Water Resources Act CAP W2 LFN 2004,⁴⁵ only focused on water resource development. Included in the functions of the Commission is the issuance of Water Resources Development or Operating Licences, under the Act. Such a licence is required for any promoter intending to undertake a hydro-electric power project.

The River Basin Authorities were created by the River Basins Development Act Cap 396, LFN 1990.⁴⁶ This Act establishes and regulates the eleven (11) River Basin Authorities in Nigeria. Their functions include undertaking comprehensive development of surface and underground water resources for various uses, as well as to construct, operate and maintain dams, dykes, polders, wells, boreholes, irrigation and drainage systems, and other works necessary for the achievement of the Authority's functions. Furthermore, given the potential for small hydro power generation within the jurisdictions of these River basins, investors will require the collaboration, and possible issuance of authorizations from the Authorities prior to engaging in construction of hydroelectric plants within the territories of the Authorities.

⁴⁵ Lawnigeria.com. Retrieved from <http://lawnigeria.com/LawsoftheFederation/WATER-RESOURCES-ACT.html>

⁴⁶ FAO Legal Office. Retrieved from <http://faolex.fao.org/docs/pdf/nig18394.pdf>

Figure 5: The River Basin Authorities



Source: Scientific Research⁴⁷

2.3.7. Federal Ministry of Trade and Investments

The Federal Ministry of Trade & Investment (FMTI) was created with the responsibility to diversify the economy by promoting trade and investment, with special emphasis on increased production and export of non-oil and gas products. It has jurisdiction over business standards and practices, consumer protection, and bilateral and multilateral trade relations and exports. The FMTI implements the National Trade Policy with the aim of keeping up with global trends in international commerce while providing detailed guidelines for importers and exporters in conjunction with the Ministry of Finance.⁴⁸ The Ministry has responsibility for issuing export permits for the export of petroleum products, as well as setting the Domestic Gas Supply Obligations (DGSO) volumes under the National Domestic Gas Supply and Pricing Regulations 2008.

⁴⁷ Surface Temperature Anomalies in the River Niger Basin Development Authority Areas, Nigeria. Atmospheric and Climate Sciences. Vol.3 No.4(2013). Retrieved from http://file.scirp.org/Html/14-4700203_37125.htm

⁴⁸ Orlean Investment. Role of Government Agency (2014). Retrieved from: <http://www.orleaninvest.com/roles-of-government-agencies-feb-13-2014/>

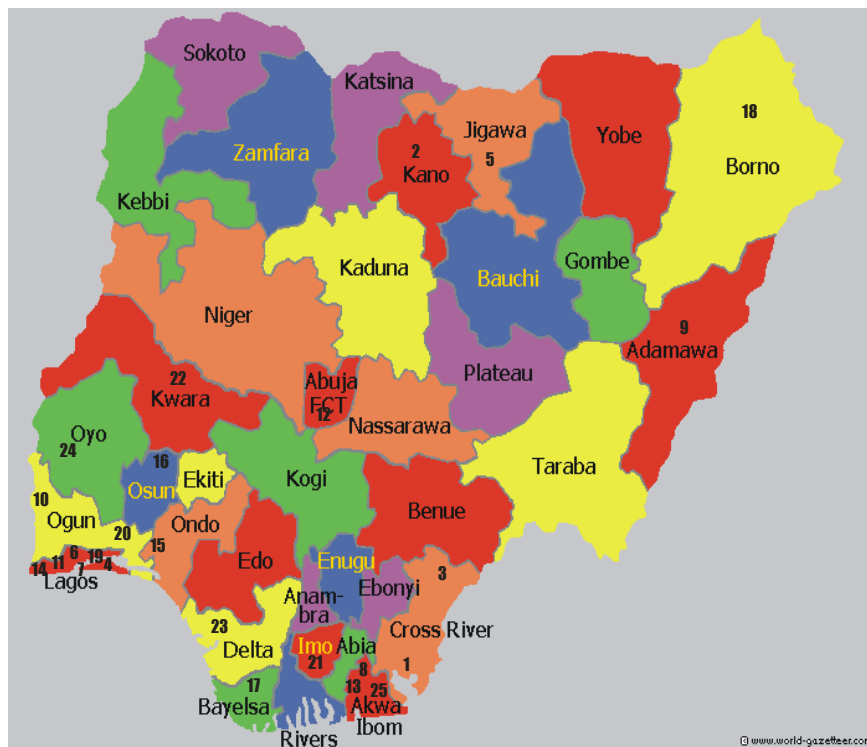
Export Processing Zones and Free Trade Zones Authorities are authorized by law to operate and regulate Zones which are clearly delineated and fenced, and are deemed to be outside the customs' territory within which national laws related to production, trade and other economic activities are not applicable or partially applicable. These zones are normally set up for manufacturing concerns producing mainly for the export market. The common features of a free zone include a location-specific and clearly delineated area, world-class infrastructure and facilities, special tax and physical incentives, and streamlined administrative arrangements (one-stop-shop window). In Nigeria, there are two types of free trade concepts: the specialised and the general-purpose trade/export zone. For effective management of these zones, two bodies are in place: the Nigerian Export Processing Zone Authority (NEPZA)⁴⁹ for general-purpose zones and the Oil & Gas Free Zone Authority (OGFZA)⁵⁰ for oil & gas zones.

The Zones are as follows: Calabar Free Trade Zone, Cross River State (1), Kano Free Trade Zone, Kano State (2) Tinapa Free Zone & Resort, Cross River State (3), Snake Island Integrated Free Zone, Lagos State (4), Maigatari Border Free Zone, Jigawa State (5), Ladol Logistic Free Zone, Lagos State (6), Airline Service Export Processing Zone, Lagos state (7), ALSCON Export Processing Zone, Akwa Ibom State (8), Sebore Farm Export Processing Zone, Adamawa State (9), Ogun Guangdong Free Trade Zone, Ogun State (10), Lekki Free Trade Zone, Lagos State (11), Abuja Technology Village Free Zone, Abuja (12), Ibom Science & Technology Park Free Zone, Akwa Ibom (13), Lagos Free Trade Zone, Lagos State (14), Olokola Free Trade Zone, Ogun & Ondo States (15), Living Spring Free Trade Zone, Osun State (16), Brass LNG Free Zone, Bayelsa State (17), Banki Border Free Trade, Borno State (18), OILS Logistics Free Zone, Lagos State (19), Kajola Specialized Railway Free Zone, Ogun State (20), Imo Guangdong Free Trade Zone, Imo State (21), Kwara Free Trade Zone, Kwara State (22), Koko Free Trade Zone, Delta State (23), Oluyole Free Trade Zone, Oyo State (24), and Ibom Industrial City Free Zone, Akwa Ibom State (25). See the locations on the map below.

⁴⁹ Nigeria Export Processing Zones Authority. Retrieved from <http://www.nepza.gov.ng/downloads/NEPZA631992.pdf>

⁵⁰ Lawnigeria.com. Retrieved from <http://lawnigeria.com/LawsoftheFederation/OIL-AND-GAS-EXPORT-FREE-ZONE-ACT.html>

Figure 6: Location of Free Zones in Nigeria



Source: NEPZA⁵¹

The Nigerian Export Promotion Council (NEPC) is established by the NEPC Act No. 41 of 1988⁵² to enhance the performance of the Council by minimizing bureaucratic bottlenecks and increasing autonomy in dealing with members of the private sector. The statutory roles of the Nigerian Export Promotion Council are to promote the development and diversification of Nigerian's export trade, assist in promoting the development of export related industries in Nigeria, spearhead the creation of appropriate export incentives, and articulate and promote the implementation of export policies and programs of the Nigerian Government. Another relevant law related to their responsibilities is the Export (Incentives and Miscellaneous Provisions) Decree No. 18 of 1986.⁵³

⁵¹ NEPZA. Retrieved from <http://www.nepza.gov.ng/freezones.asp>

⁵² Lawnigeria.com. Retrieved from <http://lawnigeria.com/LawsOftheFederation/NIGERIAN-EXPORT-PROMOTION-COUNCIL-ACT.html>

⁵³ Lawnigeria.com. Retrieved from <http://www.nigerianexporter.org/laws/Export%20Incentives%20And%20Miscellaneous%20Provisions%20Act.doc>

The Nigerian Investment Promotion Commission (NIPC) was established by the NIPC Act No. 16 of 1995 (now Cap N117 LFN 2004)⁵⁴ to promote, facilitate and advocate investments in Nigeria. The basic functions and powers of the NIPC⁵⁵ as listed in the Act are to provide necessary assistance and guidance for the establishment and operation of enterprises, enhance the investment climate in Nigeria, promote investments, disseminate information about opportunities, provide information on available incentives, support incoming and existing investors, and advise government policies that will promote the industrialisation of Nigeria.

2.3.8. Nigerian Electricity Regulatory Commission (NERC)

Under the Electric Power Sector Reform Act of 2005, the Nigerian Electricity Regulatory Commission was created as the sole and independent regulator of the power sector, with the authority to interpret and implement the NEPP as it applies to the industry. In regulating the power sector, NERC is mandated to promote competition and private sector participation, establish and approve appropriate operating codes and standards, establish consumer rights and obligations, licence and regulate operators in the sector, approve amendments to the market rules, and monitor the operation of the Nigerian electricity market.⁵⁶

In order to perform its duties, the Commission has approved various regulatory tools including the following industry guidelines:

- a) **The Market Rules** provide guidelines for the pre-transition, transition, medium and long term stages of the Nigerian Electricity Market, with the objective to establish and govern an efficient, competitive, transparent and reliable market.
- b) **The Multi-Year Tariff Order (MYTO)** is the tariff vehicle designed to provide a unified way to determine efficient total industry revenue requirement, and provide a 15-year view ahead for tariffs in the sector. MYTO is based on several principles and assumptions which are used to set wholesale and retail prices. NERC has determined that the price of wholesale electricity will be at the level required by an efficient new entrant to cover life cycle costs. The costs of the entire value chain are reflected in the

⁵⁴ International Center for Nigerian Law. Retrieved from <http://www.nigeria-law.org/Nigerian%20Investment%20Promotion%20Commission%20Act.htm>

⁵⁵ Section 4 of the NIPC Act No. 16 of 1995 (now Cap N117 LFN 2004)

⁵⁶ NERC. Retrieved from <http://www.nercng.org/>

retail tariff, beginning with fuel costs for generation, up to when the electricity gets to the consumer. The Commission has approved MYTO II to replace MYTO I, which was in effect from 2010-2015. MYTO is reviewed every 5 years, but minor reviews take place every six (6) months.

- c) **The Grid Code** contains the day-to-day operating procedures and principles governing the development, maintenance and operation of an effective, well coordinated and economic transmission system for the electricity sector in Nigeria.
- d) **The Metering Code** was approved by the Commission to ensure financial viability of the electricity industry after the unbundling and privatization. It requires that modern accurate meters systems with reliable communication facilities shall be deployed across the industry production and supply chain to measure and record energy production and utilization.
- e) **The Distribution Code** is the reference for all distribution networks operated by the DISCOs that perform the functions of distributing electricity in networks, in the voltage range from 240 V up to 33 kV.

2.3.9. National Inland Waterways Authority (NIWA)

The National Inland Waterways Authority (NIWA) Act Cap N47, LFN 2004⁵⁷ provides for the establishment of the National Inland Waterways Authority with responsibility to regulate, improve and develop inland waterways in Nigeria for navigation. Its functions also include developing infrastructure, undertaking dredging of waterways and hydrological and hydrographic surveys, designing ferry routes, operating ferry services, issuing licences for local ships, collecting river tolls, etc. Hence, all inland waterway courses are managed by this authority. The agency is under the Federal Ministry of Transportation. A Permit/Licence must be issued by NIWA where utility lines would cross the inland waterways or for projects requiring water intake, such as hydro projects and power plants requiring water for their cooling systems.

⁵⁷ Lawnigeria.com. Retrieved from <http://lawnigeria.com/LawsoftheFederation/NATIONAL-INLAND-WATERWAYS-ACT.html>

2.3.10. The Nigerian Bulk Electricity Trading Co. (NBET)

The NBET was established under Section 8 of the EPSR Act of 2005 to purchase electricity from generating companies through bankable Power Purchase Agreements (PPAs) and sell to the distribution companies through Vesting Contracts (VC) with security. Its mandate includes creating an effective transaction environment which minimizes risk and allocates it fairly to the parties best able to manage it, implementing a transparent procurement process which would result in the economic procurement of power, and entering into contracts that are well structured and managed in a manner that precludes recourse to any credit guarantee instrument. The NBET is not envisaged to be the sole bulk buyer of electricity, as other entities such as distribution companies will also be able to procure power directly from the generation companies once they have attained commercial viability. In performing its duties, the NBET works with several Ministries in the course of negotiating PPAs with generation companies, namely:

- a) The Bureau of Public Procurement is empowered by the Public Procurement Act 2007⁵⁸ to grant prior approval for the procurement of goods and services by any government-owned entity, including the purchase of electricity.
- b) The Attorney-General of the Federation approves all agreements executed by any government-owned or funded entity, including the NBET.
- c) The Federal Ministry of Finance approves any PPA that is to be backed by the partial risk guarantees provided by World Bank and the African Development Bank.

2.3.11. The Niger Delta Power Holding Company Limited (NDPHC)

The NDPHC is a special purpose vehicle jointly owned by the three tiers of government (Federal-47%, States-35% and Local-18%) with responsibility for the implementation of the National Integrated Power Project (NIPP). The NIPP was established in 2004 by the Nigerian government as a plan to construct gas-fired power plants using natural gas that was being flared. It was a fast-track initiative to stabilize Nigeria's electricity supply system while the private-sector led structure envisaged in the EPSR Act develops. The project includes 10

⁵⁸ Lawnigeria.com. Retrieved from <http://lawnigeria.com/LawsoftheFederation/PUBLIC-PROCUREMENT-ACT.html>

generation plants, 110 transmission infrastructure facilities (including 3,000 km of high voltage lines, transformers and substations),⁵⁹ 250 distribution projects (including 4,100 km of low voltage lines, transformers and substations),⁶⁰ as well as gas projects at nine of the power plants.⁶¹ The privatization process for the ten power plants started last year, and will be concluded soon, and hand-over thereafter to the preferred bidders.

⁵⁹ Federal Ministry of Power. Retrieved from <http://image.slidesharecdn.com/power-141124035719-conversion-gate01/95/ministerial-press-briefing-2014-presentation-by-the-minister-of-power-prof-nebo-44-638.jpg?cb=1416823291>

⁶⁰ Federal Ministry of Power. Retrieved from <http://image.slidesharecdn.com/power-141124035719-conversion-gate01/95/ministerial-press-briefing-2014-presentation-by-the-minister-of-power-prof-nebo-55-638.jpg?cb=1416823291>

⁶¹ NDPHC. Retrieved from http://ndphc.net/?page_id=2900 & http://ndphc.net/?page_id=3429

3. National energy sovereignty

3.1 National energy sovereignty as a universal principle

The 2015 International Energy Charter explicitly recognises the sovereignty of each state over its energy resources and its right to regulate energy transmission and transportation within its own territory, respecting all relevant international obligations. In the spirit of political and economic cooperation, signatories agree to promote the development of efficient, stable and transparent energy markets at regional and global levels, taking into account environmental concerns and the role of energy in each country's national development. To this end, signatories agree to take coordinated action to achieve greater coherence of energy policies, which should be based on the principle of non-discrimination and on market-oriented price formation.

3.2 Nigerian Constitution

Between 1914 and 1960, during the colonial era, Nigeria was governed by orders in council, since the country was administered as a Crown Colony. These constitutions include those of 1913 (which came into effect on 1 January 1914), 1922 (Clifford Constitution), 1946 (Richardson Constitution), 1951 (Macpherson Constitution) and 1954 (Lyttleton Constitution). During the first democratic era, Nigeria had the Independence Constitution in 1960, its first constitution as a sovereign state, which came into force immediately upon independence, on 1 October 1960. The 1963 Constitution for the First Republic, which was based on the Westminster System (parliamentary system of government), was subsequently enacted, and continued in operation until a military coup in 1966.

Upon return to civilian rule, the 1979 Constitution was enacted for the Second Republic, and it abandoned the Westminster System in favour of an American-style Presidential System. This Constitution was again suspended in 1983 by a military coup. Based on the intention of the military to see the return of democratic rule to Nigeria, the 1993 Constitution was drafted for the establishment of a Third Republic, but it was never fully implemented as the military annulled the election and resumed power until 1999. After the various successive military governments between 1979 to 1999, democracy was restored, and the Fourth Republic was

ushered in by the 1999 Constitution,⁶² which still remains in force today with some minor amendments.

The Constitution establishes the basic principles of Nigeria, and sets out the country's fundamental objectives, which include the defence of independence and sovereignty, consolidation of national unity, the promotion of balanced economic, social and regional development, the defence and promotion of human rights and the equality of citizens before the law.

Under the constitution, Nigeria has acceded to and observes the United Nation Organizations Charter and African Union Charter principles. All international treaties and protocols ratified by the country remain in force under Nigeria legal framework. In terms of international solidarity, Nigeria actively participates in the international area to restore a fairer and more equitable economy, both domestically and regionally.

In terms of economic rights, the Constitution recognizes and guarantees private property rights. Expropriation is carried out in utility and public interest under the national laws and with right to fair compensation. In terms of labour rights, the national constitution establishes the right of freedom of association and membership of labour unions. The national constitution also emphasizes that natural resources within the territory are state property. The Constitution vests ownership of mineral resources, including oil and gas, exclusively in the federal government, and further confers on the federal government exclusive powers to make laws and regulations for the governance of the industry.⁶³

Generally, there are no laws or regulations that hinder the participation of foreign investment, and firms do not restrict foreign participation. In fact the government has through various reform processes opened up various sectors for participation by foreign companies interested in doing business in Nigeria. Foreign investors are mandated to operate within the national economic policy framework, which allows foreign enterprises to participate in all national territory and economic sectors, except for sectors where it is reserved for state operation. The

⁶² International Center for Nigerian Law. Retrieved from <http://www.nigeria-law.org/ConstitutionOfTheFederalRepublicOfNigeria.htm>

⁶³ CFRN, Item 39, Second Schedule, Part 1. Retrieved from <http://www.nigeria-law.org/ConstitutionOfTheFederalRepublicOfNigeria.htm>

constitution establishes that land is the property of the state and therefore it cannot be sold, transferred or mortgaged without the consent of the government.

3.3. Reforms in the Energy Sector

3.3.1. Power Sector Reform

In 2005, the Electric Power Sector Reform (EPSR) Act was enacted to provide a framework for the liberalisation of the power sector with a view of making it competitive and more efficient. It provided for the unbundling of the National Electric Power Authority (NEPA), the establishment of the Nigerian Electricity Regulatory Commission (NERC) as the sole and independent regulator (economic and technical), the privatization of the successor companies created from NEPA, and the establishment of the Rural Electrification Agency (REA). The Commission was set-up by the Federal Government (FG) in 2006, and began operation in 2007.

In July of 2008 a new electricity pricing mechanism, the Multi-Year Tariff Order (MYTO) , was introduced by the NERC to help determine charges and tariffs for electricity generation, transmission, as well as distribution (retail) tariffs, over the period from July 2008 to June 2013. The MYTO provides a 15-year tariff path for the sector with limited minor reviews bi-annually in the light of changes in select parameters and periodic reviews every five (5) years. This pricing regime provides the structured framework to ensure that tariff is cost reflective thereby reassuring and encouraging investors, and also providing a fair entry levels for them. In 2014, the NERC reviewed the Tariff Order, and introduced MYTO II as the present tariff regime in Nigeria.

The reform and privatization framework requires that the NEPA unbundle its activities in the generation, transmission and distribution sub-sectors. The Electricity (Amendment) Decree 1998 and the NEPA (Amendment) Act 1998 were passed, terminating the monopoly status of the NEPA, and officially inviting the participation of the private sector. In November 2005, 18 new successor companies were incorporated by the Federal Government, comprising six (6) generation, one (1) transmission, and eleven (11) distribution companies were incorporated.

Subsequently, the market rules and network codes (grid, distribution, and metering codes) to guide the operations in the sector were approved by the NERC. In January 2012, the Power Ministry liquidated the Power Holding Company of Nigeria (PHCN), and unbundled it into 18 successor companies which were sold to successful bidders in November 2013. The distribution companies were privatized through the sale of majority shares to core investors, the transmission company was handed over to a management company, the thermal generating companies were sold to private investors, and the hydroelectric industry began operating as a concession.

3.3.2. Reform of the Oil and Gas Sector

The principal legislation for oil and gas activities in Nigeria is the Petroleum Act of 1969 (the Act). The Act was enacted primarily for crude oil operations and provides very little on gas development and utilisation. A need for reforms has been recognized in Nigeria, and this has led to the development of the National Oil and Gas Policy (NOGP) in 2004 which establishes a comprehensive National Gas Master Plan (NGMP). The NGMP comprises of the gas pricing policy, the domestic gas supply obligation, and the gas supply infrastructure blueprint. The National Domestic Gas Supply and Pricing Policy 2008 (the Policy) and the National Domestic Gas Supply and Pricing Regulations 2008 (the Regulations) focus on the pricing for the supply of gas to strategic sectors of the economy, and the establishment of a Department of Gas (DoG) and the domestic gas aggregator (i.e., GACN).

Presently, the Petroleum Industry Bill (PIB) of 2012,⁶⁴ which was drafted by the Ministry of Petroleum Resources, is before the National Assembly. The PIB, which is expected to reform the petroleum sector, was first proposed in 2008, but the most recent draft was submitted in July 2012. The PIB includes provisions that could cause the following: increase exploration activities and expand reserves; monetize natural gas reserves and reduce flaring; create separate regulators for the upstream, midstream, and downstream sectors; deregulate the downstream sector; offer acreage through bid rounds, increase government take, higher royalties, lower production taxes, increase local participation; and establish the Petroleum Host Communities Fund (PHCF). This delay in enactment has also slowed the development

⁶⁴ International Centre for Nigerian Law. Retrieved from <http://www.nigeria-law.org/Legislation/LFN/2012/The%20Petroleum%20Industry%20Bill%20-%202012.pdf>

of natural gas projects (as it is expected to introduce new fiscal terms to govern the natural gas sector), as well as investment in deep-water projects (it is expected to provide for an increase in the government's share of production revenue from such projects).

The PIB also proposes the creation of two new regulators to take over the functions, assets and liabilities of the DPR and the DoG relating to downstream gas, and the DPRA will also assume the role of the current Petroleum Products Pricing Regulatory Agency. The PIB also incorporates key provisions of the DGB which focuses on the efficient regulation of a liberalised downstream gas sector.

The passage of the PIB is expected to strengthen competition and improve the prevailing business environment in the industry to attract investors into the oil and gas sectors, just like the EPSR Act of 2005 is doing in the electricity sector.

3.4. National strategy

3.4.1. General Energy Policies

Various legislative, policy and regulatory documents have been developed and approved by the federal government for the energy sector in Nigeria.

The National Energy Policy (NEP) of 2003 is the basis for the energy sector. It was developed and implemented by the Energy Commission of Nigeria (ECN). It covers all aspects of the energy sector, including renewable energy, energy efficiency and rural electrification, and sets the target of 75% electrification by 2020. Although the policy may require updates, it still remains in force as the guiding principle for the direction of sector reforms. On renewable energy, it made provisions for all forms of renewables energies and how they can be effectively utilised. On energy efficiency, it called for the promotion of energy conservation at all levels of exploitation of energy resources by adopting energy efficient methods in energy utilisation. On rural electrification, it recommends the promotion of off-grid and standalone systems in order to supply electricity to remote areas of the country.

The National Economic Empowerment and Development Strategy (NEEDS) was developed by the National Planning Commission, and approved in 2004. It was intended as the response to the development challenges of Nigeria, and envisaged as a medium-term plan for 2003-2007, and places high priority on the development of the power sector. In regards to infrastructure, the policy promotes the privatisation of infrastructure regarded as key instrument for achieving improved service delivery. The government would still fund projects with high investment requirements or low attractiveness for the private investors. The document further suggests increasing the share of renewable energy in the total energy mix in Nigeria.

The National Energy Master Plan (NEMP) of 2007 sets the implementation framework of the National Energy Policy for the development of the sector and its effective contribution to the country's economy. It covers the development, exploitation, and supply of all energy resources (petroleum and electricity), utilisation of renewable energy sources, their use by different sectors, and other related topics such as the environment, energy efficiency, energy financing, and energy policy implementation.

Vision 20-2020 was developed by the National Planning Commission in 2009, as the long term development strategy for the country in order to ensure that Nigeria becomes one of the top 20 economies of the world by 2020. The programme identifies the barriers to the country's development, including unreliable power supply, and decaying infrastructure. It recommends the directions for achieving the target using a strategy of three main pillars building one on the other, and the provision of energy is regarded as a key component of all three pillars. Its development is intended to be led by the private sector in a liberalised market, while the government and agencies provide the legal and regulatory environment. Overall, an increase of the installed capacity to 35,000 MW by 2020 is planned (a 6 GW capacity base by 2009 achieved by rehabilitation of the existing Power Holding Company of Nigeria's plants and completion of on-going Independent Power Producer (IPP) projects, 20GW through the increase of capacity by IPPs and the National Integrated Power Projects (NIPP) , and final target capacity of 35 GW by adding large hydro-power schemes, coal-fired power facilities and renewable energy plants. Since these plans require a considerable amount of investment, the vision creates an environment that is purportedly attractive to outside investors. The idea in the Vision is to achieve this through deregulation and a transparent regulation, provision of guarantees for investments, and allowance for a reasonable rate of return for investors.

3.4.2. Electricity Sector

The National Electric Power Policy (NEPP) of 2001 sets the specific framework for the power sector. It was developed and approved by the former Ministry of Power and Steel. It defined the three principal phases for achieving the reform goal of a reliable and sufficient energy system, namely: the privatisation of the vertically-integrated NEPA and the introduction of IPPs; increasing the competition between market participants, reduction of subsidies, and sale of excess power to distribution companies; and intensification of the market and competition, liberalised selection of supplier by larger customers, and full competitive market trading. The provisions were mostly incorporated into the EPSR Act of 2005 which provides the legal and regulatory framework for the sector.

The Renewable Electricity Action Programme (REAP) was launched in 2006 by the ECN and the United Nations Development Programme (UNDP) to operationalize the REPG. It gives an overview on the Renewable Energy potentials, technologies and market, and then elaborates on the development targets per technology and application, and strategies for their achievements. It also outlines financing procedures via the Renewable Electricity Fund (REF) and other sources, as well as the roles of government bodies in achieving the targets. The core focus of the document is on utilising all forms of renewable energy sources for electricity generation and highlights potential gaps, technical assessments, financial implications, benefits and limitations of Nigeria's renewable energy sources potentials.

The Roadmap for Power Sector Reform was created by the Presidential Taskforce on Power (PTFP) in 2010 (reviewed in 2013). It does not introduce new policies but rather sets strategies to accelerated actions for achieving the objectives of the National Energy Policy (2003) as enshrined in the EPSR Act of 2005. It aims at providing an update on the status of the reform as well as pointing out critical issues and challenges which should be addressed in the period of 2013–2014. The Roadmap is very limited in terms of renewable energy, energy efficiency and rural electrification. The core focus of the Roadmap was on other forms of energy delivery systems. In order to bridge the gap between supply and demand, the Roadmap sets the ambitious targets to increase installed hydro to 5,690MW, thermal to over 20,000MW, and 1000 MW of renewable generation capacities by 2020.

3.4.3. Oil & Gas

The National Oil and Gas Policy (NOGP) of 2004 provides for the establishment of a comprehensive National Gas Master Plan (NGMP), liberalisation of the downstream gas sector and open access, appropriate gas pricing, attention to domestic growth as well as revenue from gas export. The Plan recommends the enacting of a law that addresses all the objectives of the Policy.

The NGMP of 2008 includes the gas pricing policy (provision of a framework for establishing the minimum domestic gas price), the domestic gas supply obligation (an obligation on upstream gas producers to supply gas to the domestic market) and the gas supply infrastructure blueprint.

The National Domestic Gas Supply and Pricing Policy of 2008 (the “Policy”) and the National Domestic Gas Supply and Pricing Regulations 2008 (the “Regulations”) were made pursuant to the petroleum Act of 1969. The Policy focuses on the pricing for the supply of gas to the three strategic sectors of the economy identified under the NGMP, while the Regulation establishes a Department of Gas (DoG) within a “Ministry of Energy” to regulate the gas sector, and the Gas Aggregation Company of Nigeria (GACN) Limited for processing requests from domestic gas buyers, managing the allocation of gas to domestic buyers, facilitating negotiations of Gas Supply and Aggregation Agreements (GSAA), etc.

The PIB of 2012 proposes the creation of the Downstream Petroleum Regulatory Agency (DPRA) and the Upstream Petroleum Inspectorate (UPI) to take over the functions, assets and liabilities of the Department of Petroleum Resources and the DoG relating to downstream gas. The DPRA will also assume the role of the current Petroleum Products Pricing and Regulatory Agency. The role of the domestic gas aggregator is also recognized, and the Draft Bill reflects the key provisions of the DGB, NOGP and NGMP. The key provisions of the Downstream Gas Bill (DGB) 2005 has been included in the PIB, focusing on the efficient regulation of a liberalised downstream gas sector.

3.4.4. Renewable Energy

The Renewable Energy Policy Guideline (REPG) issued by the Federal Ministry of Power and Steel in 2006 stipulates that the federal government would expand the market for renewable electricity to at least five per cent of total electricity generation and a minimum of 5TWh of electric power production by 2016. The document is the government's overarching policy on all electricity derived from renewable energy sources, and sets out its vision, policies and objectives for promoting renewable energy in the power sector.

The Renewable Energy Master Plan (REMP) was drafted in 2006 by the ECN and the UNDP, and was reviewed in 2013. It defines a road map for increasing the role of renewable energy in achieving sustainable development in the country. In addition to the overall increase in power supply from renewable energy sources, it targets higher electrification rates, from 42% in 2005 to 60% in 2015 and 75% by 2025. It stresses the importance of solar power in the country's energy mix. Based on the Plan, supply of renewable electricity is expected to increase from 13% of total electricity generation in 2015 to 23% by 2025 and 36% by 2030. Renewable electricity is projected to account for 10% of the total energy consumption by 2025. The Plan has not been approved by the government.

The National Bio-fuel Policy and Incentives was issued in 2007 by the National Nigerian Petroleum Corporation (NNPC) for a biofuel support programme aiming at integrating the agricultural sector of the economy with the downstream petroleum sector. The objective of the policy was the development and promotion of a national fuel ethanol industry utilising agricultural products in order to improve the export properties of automotive fossil-based fuels produced in Nigeria. The policy sets out to link the agricultural and energy sectors with the underlying aim of stimulating development in the agricultural sector.

The National Renewable Energy and Energy Efficiency Policy (NREEEP) was finalized as a draft in 2013 by the Federal Ministry of Power, and aims to provide a framework for the promotion of renewable energy and energy efficiency. It recommends that an appropriate strategy should be developed to harness the potentials in renewable energy to add value to the ongoing changes in Nigeria's power sector, and calls for an integrated renewable energy and energy efficiency policy. Also, it encourages the development of national action plans for

renewable energy and energy efficiency. The overall focus of the policy is on optimal utilisation of the nation's energy resources for sustainable development.

3.4.5. Rural Electrification

The Rural Electrification Policy Paper (REPP) was created by the Federal Ministry of Power (FMP) and approved in 2009. It establishes the framework and objectives for a rural electrification programme. It sets the target of 10% of rural electrification mix by 2025.

The Rural Electrification Strategy and Implementation Plan (RESIP) which was developed in 2013 will establish a clear institutional step-up for the sector and set a roadmap that results in the establishment of an enabling framework. The draft RESIP, which is also an outline of the policy on rural electrification, is a national document that applies *pari pasu* to the states and local government areas. The primary objective of the Rural Electrification Policy and the Plan is to promote rapid expansion of access to electricity in a cost-effective manner through the use of the grid and off-grid approaches. It expects subsidies to be primarily focused on expanding access rather than consumption. The draft is still awaiting approval, as well as the draft Guidelines to Operationalize the Rural Electrification Fund (REF).

4. Energy Security

4.1 Energy security as a universal principle

The 2015 International Energy Charter recognizes the importance of energy Security, a concept that embraces the needs of energy producing, transit and consuming countries, as well as access to modern energy services that is based on environmentally sound, socially acceptance and economically viable policies. In order to achieve energy security, International Energy Charter signatory affirm the importance of freedom of movement of energy products and of developing an efficient international energy infrastructure in order to facilitates the development of stable and transparent trade in energy. In addition to this, signatories to the International Energy Charter highlight the importance of diverse energy sources and supply routes to enhance energy security.

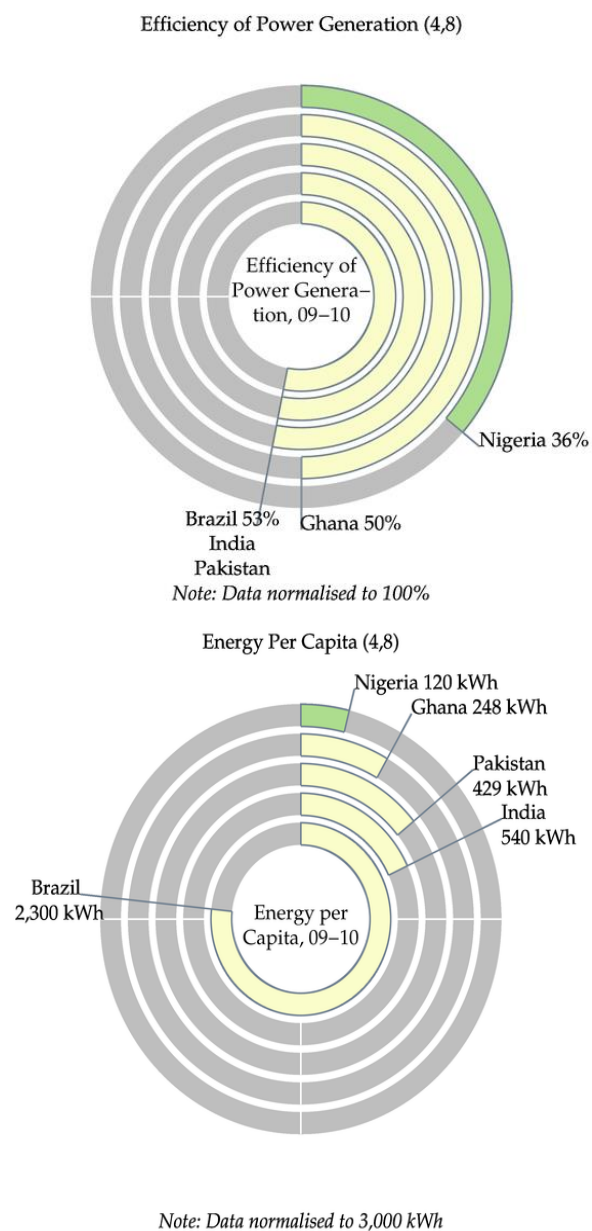
4.2 Energy security in Nigeria

Energy is a critical prerequisite for all sectors of the economy. It is an essential service that determines the success or failure of development endeavours. The importance of energy as a sector in the national economy can therefore not be overemphasized. Nigeria is endowed with enormous energy resources (non-renewable and renewable) but most of its economic activities are oil and gas based which is finite and environmentally unfriendly. For example, oil and gas account for about 80% of government revenues, 90-95% of export revenues, and over 90% of foreign exchange earnings. Also, about 64% of the nation's electricity generation comes from oil and gas, and the transportation system is almost completely dependent on oil and gas. Sole dependence on a particular energy option does not guarantee the energy security of the nation. A 1999 UNDP report defines energy security as the continuous availability of energy in varied forms in sufficient quantities at reasonable prices.⁶⁵ Thus, energy security not only entails sufficient energy reserves or potentials, but also its availability, accessibility and affordability.

No access to power hinders the country's development in all sectors from education up to industrial production. Nigeria's Achilles heel is therefore electricity, and priority is being given to the power sector to avoid the risk of the country stagnating economically in the coming years. The Nigerian power sector has been in crisis for many years. Much of the generation, transmission and distribution capacity has become obsolete or dilapidated. In 2010 the average annual per capita power consumption in Nigeria was only 120 kWh, among the lowest in the world, even though Nigeria is the world's 5th largest oil producer.

⁶⁵ J, Ikeme, Assessing the Future of Nigeria's Economy: Ignored threats from the global climate change debacle. African Economic Analysis, De Montfort University, Leicester, UK, 2008.

Figure 7: Efficiency of Power generation and Energy Per Capita in Nigeria and other countries, 2010.



Source: Action Nigeria, Power⁶⁶

In Nigeria nearly half of the population do not have access to power, but those with access frequently experience outages that can amount up to several hours a day. This leaves them with no other option other than purchasing generators, and thus 60 million Nigerians⁶⁷ spend an average of N3.5 trillion a year (\$17.5 billion US dollars)⁶⁸ on personal generators.

⁶⁶ Action Nigeria, Power. Retrieved from <http://www.actionnigeria.com/power.html>

⁶⁷ BBC. Retrieved from <http://www.bbc.com/news/world-africa-25056721>

⁶⁸ Vanguard Newspaper. Retrieved from <http://www.vanguardngr.com/2013/01/nigeria-spends-n3-5trn-annually-on-power-generators/>

Nigerians pay more than N80 (£0.32)/kWh burning candles and kerosene, manufacturers pay in excess of N60 (£0.24)/kWh on diesel generation, those that can afford personal generators pay around N50-70 (£0.20-0.28)/kWh for self-generation, whereas the inconsistent grid power costs only between £0.18 and £0.23/kWh.⁶⁹ Absence of adequate power is the most significant barrier to economic growth in Nigeria, and if the power situation continues as is until 2020, £81b in GDP would be lost by Nigeria every year.⁷⁰

The poor state of the power system is the result of many years of neglect, and a poor maintenance record for the existing facilities. The FG neglected investing in the government-owned electricity company, thereby causing the available generation capacity and transportation infrastructure to not grow with the population (which has almost doubled in the past 30 years), and infrastructural development in the country with their accompanying energy demands. This has made access to electricity the most problematic obstacle to Nigeria's growth.

Investment in power generation, transmission and distribution is required to address the problems of low access to electricity, as well as technical and non-technical losses. The government is putting a lot of effort to achieve this by implementing different projects discussed in previous section, in addition to implementation of various policies. Presently, energy is the key focus of various reform programmes, with a view to liberalize the sector, attract investments (especially FDIs) to enable Nigeria to reach the various targets set in policies documents. The privatization of the PHCN-successor companies indicated the governments commitment to liberalise the power sector and attract private investment.

Nigeria has ambitious and progressive expansion plans for its energy industry, particularly in the urban and semi-urban areas. In terms of the challenge of universal access, the goal is to ensure universal access by diversifying the country's energy mix, and renewable energy is becoming an attractive sector for many investors.⁷¹ Encouraging the installation of PV systems in schools, hospitals, and public buildings in remote areas is gaining momentum. The

⁶⁹ The Guardian. Retrieved from <http://www.theguardian.com/global-development-professionals-network/adam-smith-international-partner-zone/nigeria-power-electricity-africa>

⁷⁰ The Guardian. Retrieved from <http://www.theguardian.com/global-development-professionals-network/adam-smith-international-partner-zone/nigeria-power-electricity-africa>

⁷¹ Deutsche Welle. Retrieved from <http://www.dw.de/nigerians-turn-to-renewable-energy-as-solution-to-power-crisis/a-18216818>

use of solar energy as option to deal with increasing energy demand in the public services, i.e. schools, health centres, buildings and housing, is a viable option for increasing energy access in remote areas.

Energy security in Nigeria is also associated with policies of energy efficiency that are being put in place, including the creation of a coherent legal framework with the production and use of energy resources in a rational and responsible way. Several programs have been adopted encouraging the efficient use of renewable energy sources. In this context, Nigeria has been adopting measures of policies and strategic programs of production and the efficient use of electricity, creating conditions for national energy security as well as regional energy security, taking advantage of these trade gains.

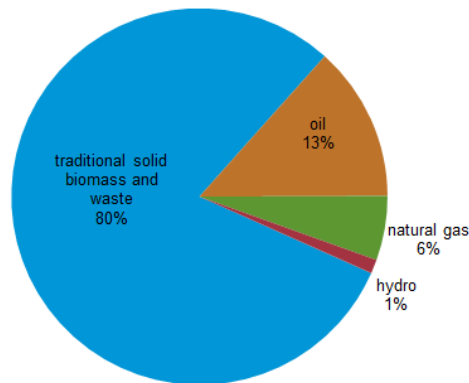
Taking into account the evolution of the ongoing reform programmes in the energy sector, the focus on diversifying the energy mix in the country, as well as the various ongoing projects previously discussed, the assessment on energy security in Nigeria under the definition of the International Energy Charter is promising. Nigeria is heading towards a direction in which, if all projects in the generation sub-sector, as well as the expansion and fortification of the distribution and transmission infrastructures are completed, Nigeria can be self sustainable to meet the growing domestic demand.

In addition to this, regional integration is also considered to increase energy security of supply. Under the West African Power Pool (WAPP), Nigeria is part a plan by 14 countries in ECOWAS region to integrate the operations of their power systems into a unified electricity market for the sale of electricity, and to accommodate the transit of electricity between countries in order to assure energy security in the region.

4.3. Energy consumption and production

Nigeria has abundant indigenous energy resources including hydro, natural gas, coal, solar, geothermal, wind power, uranium and biomass, much of which is untapped. Social and economic development of the country will be accelerated through effective exploitation and utilisation of these resources. Based on that, the government is encouraging the private sector to participate in the development of these energy resources for power generation which will be used at local as well as regional level.

Figure 8: Primary Energy Consumption in Nigeria for 2012



Source: U.S. Energy Information Administration (EIA) International Energy Agency⁷²

The U.S. Energy Information Administration (EIA) estimates that total primary energy consumption in Nigeria was about 4.5 quadrillion British thermal unit (Btu) in 2012. About 80% is traditional solid biomass and waste in the form of wood, charcoal, manure, and crop residues. Commercial energy sources such as oil, natural gas, and hydro account for the remaining 20%. That means that oil accounts for about 13% , natural gas 6%, and hydro 1% as shown below. It is believed that approximately 100 million people in Nigeria are without access to electricity, meaning that the electrification rate in Nigeria is estimated at 48%.⁷³

5. Open Markets and technological transfer

5.1 Open energy markets and technological transfer as a universal principle

Under the 2015 International Energy Charter, open markets refers to the liberalisation of the energy sector, and signatories agree to participate in joint efforts to facilitate and

⁷² U.S. Energy Information Administration (EIA) International Energy Agency Country Analysis: Nigeria, page 2. Retrieved from <http://www.eia.gov/countries/analysisbriefs/Nigeria/nigeria.pdf>

⁷³ World bank. Retrieved from <http://data.worldbank.org/indicator/EG.ELC.ACCS.ZS/countries>

promote market-oriented reforms and modernisation of the energy sector. The signatories also agree to promote open and competitive markets for energy products, materials, equipment and services, as well as remove barriers to energy trade in a manner that is consistent with the provisions of the WTO Agreement and other international obligations. It is important to note that under the International Energy Charter, liberalisation is not an obligation, but a principle that countries are encouraged to develop according to their national sovereignty and national strategy.

5.2 Open energy markets

Within the context of the International Energy Charter, open markets imply having a competitive market for energy products, materials, equipment and services. It also includes the transparent access to energy resources, removal of barriers, promoting the development and interconnection of energy transport, promoting access to capital, and facilitating the transit of the energy.

The economic and social reforms that have been implemented for many years has brought profound changes in the economic landscape of the country, with privatization programs and legal framework reform. The laws on Investment in Nigeria arose as a result of these changes.

The investment laws have come to embody the need of the country to attract more investment, to be open for private investors, and to set a basic and uniform legal framework for the process of conducting national and foreign investments. Under this law, foreign investors enjoy the same rights, duties and obligations as nationals. The guarantees and incentives are also part of the provision for investors, and establish the protection of property rights, the transfer of funds abroad (profits, royalties, amortization and other funds), as well as the possibility of mediation and conflict resolution among investors using international mediation or arbitration conventions.

The NIPC was established to promote investment for the country by attracting and retaining substantial direct domestic and foreign investment to boost economic growth and wealth creation, including the promotion of public-private partnerships for economic and infrastructure development. For the past nine years, investment in Nigeria has grown annually, and Nigeria has also been the final destination of a large volume of foreign capital,

including in the energy and mining sectors. The volume of FDI has evolved considerably over the past ten years as a result of this market opening.

Besides this, Nigeria has been taking steps to reduce barriers to investment and improve the business environment in the country, which has resulted in encouraging progress. An important improvement in the last two years is the country's position in the environment index, which is currently placed 139 out of 189 countries in the world. As an Extractive Industry Transparency Initiative (EITI) member, Nigeria has complied with the principles and provisions of the initiative in terms of transparent access to mineral resources.

As the energy sector is liberalised, there are many private companies operating in the power generation sector, and several that have been licensed but are yet to be operational. The PHCN-successor companies are responsible for 10% of the energy production, but the companies are fully or majority-owned by private companies. While thermal stations were sold 100%, the hydro-electric plants were given under concession to private companies. It is important to note that the private companies that participated in the privatization process for the utilities are made up of local and international companies that formed consortia to bid for the government-owned companies. Presently, the last set of government-owned power plants are being auctioned to private investors.

At the distribution level, the Commission is also issuing licences to a private company to manage off-grid independent electricity distribution networks in areas in Nigeria without distribution networks, or places where the existing networks are unreliable. The transmission company is being managed by a private company, Manitoba Hydro International of Canada, to ensure its operation and the reliable and efficient expansion of electrical energy supply. Presently, the FG is reviewing options available for attracting investors to participate in the expansion and operation of the transmission grid.

In the oil and gas sector, there are a number of multinational corporations engaged in the various activities, including ExxonMobil, Shell, Total, Agip, Chevron, Eni, Elf, ConocoPhillips, in addition to various indigenous companies.

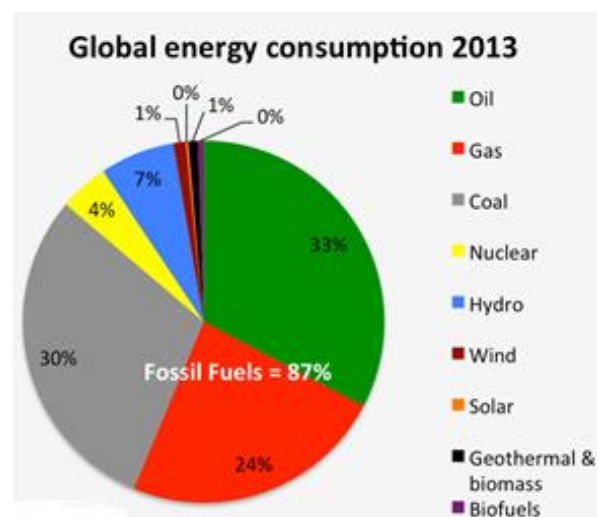
5.2.1 Hydrocarbons

5.2.1.1. Oil

Nigeria is the largest oil producer in Africa, and also holds the largest natural gas reserves on the continent. Oil production began in the oil-rich Bayelsa State in the 1950s,⁷⁴ but Nigeria became a member of the Organization of the Petroleum Exporting Countries (OPEC) in 1971. Nigeria is among the world's top five exporters of liquefied natural gas (LNG).

Nigeria's oil and natural gas industry is primarily located in the southern Niger Delta area, but the industry is the mainstay of the country's economy as it accounts for 75% of government revenue and 95% of total export revenue.⁷⁵ Nigeria's economy is vulnerable to a drop in crude oil prices as it is very dependent on oil revenue, and in has recently been affected by the drop in oil price.

Figure 9: World Energy Consumption by Fuel for 2013



Source: Value Edge⁷⁶

The Nigerian National Petroleum Corporation Act No 33 of 1977 (now CapN320 LFN 1999)⁷⁷ created the NNPC to regulate the oil and natural gas industry, and it was later divided into 12 subsidiary companies to regulate the various subsectors within the industry. The NNPC uses Joint Ventures (JV) to fund most projects, with NNPC as the majority

⁷⁴ Secretariat of the Organization of the Petroleum Exporting Countries, Nigeria facts and figures. Retrieved from http://www.opec.org/opec_web/en/about_us/167.htm

⁷⁵ International Monetary Fund, Nigeria, IMF Country Report No. 14/103, (April 2014), page 10 and 25.

⁷⁶ Value Edge, Introduction to Oil and the Energy Industry, by Sui Chuan, December 17, 2014. Retrieved from <http://www.value-edge.com/introduction-to-oil-and-the-energy-industry/>

⁷⁷ International Center for Nigerian Law. Retrieved from <http://www.nigeria-law.org/Nigerian%20National%20Petroleum%20Corporation%20Act.htm>

shareholder. To encourage investments in deepwater areas which involve higher capital and operating costs, Production-Sharing Contracts (PSCs) are also offered to IOCs as it provides a more favourable fiscal terms for them, by ensuring that the companies receive a greater share of the revenue as the water depth increases.

5.2.1.2. Petroleum and other Liquids

Nigeria has the tenth largest crude oil reserves in the world and second largest in Africa with an estimated 37 billion barrels of reserves.⁷⁸ These reserves are mostly found along the Niger Delta, and offshore in the Bight of Benin, the Gulf of Guinea, and the Bight of Bonny, even though onshore exploration activities have been undertaken in the Chad basin located in northeast Nigeria. Nigeria produces mostly light, sweet (low sulfur) crude oil which is mostly exported. Crude oil production in Nigeria reached its peak of 2.44 million bbl/d in 2005, but by 2009, production plummeted to an average 1.8 million bbl/d. Oil production rose again after 2009 mostly due to the implementation of the amnesty program which helped reduce attacks on oil facilities, and the increase in new deep-water offshore production. In 2014, Nigeria produced 2.4 million bbl/d of petroleum and other liquids (i.e., crude oil, condensate, natural gas plant liquids, and refinery processing gains).

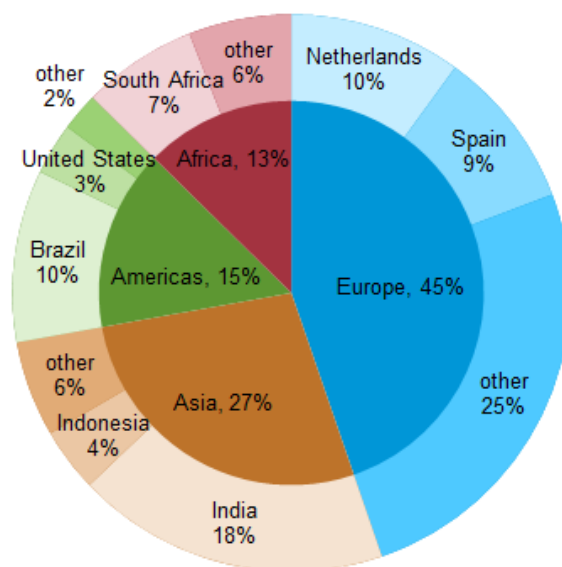
Restrictions on the production of oil and gas in Nigeria are as contained in the OPEC's annual production allocations. Nigeria's OPEC crude oil production allocation has fluctuated between 1.3 million bpd⁷⁹ and 2.5 million bpd⁸⁰ since the 1980s. Nigeria became a member of OPEC in 1971 and has since then been bound to comply with production restrictions imposed on each member country. Subject to the restrictions mentioned, parties to any exploration and production (E&P) arrangements are entitled to lift their portion of production provided that they meet all their tax and royalty obligations.

Figure 10: Nigeria's Crude Oil and Condensate Export by Region, 2014

⁷⁸ Oil & Gas Journal, Worldwide Look at Reserves and Production, (January 1, 2015). Retrieved from <http://www.ogj.com/articles/print/volume-112/issue-1/drilling-production/worldwide-look-at-reserves-and-production.html>.

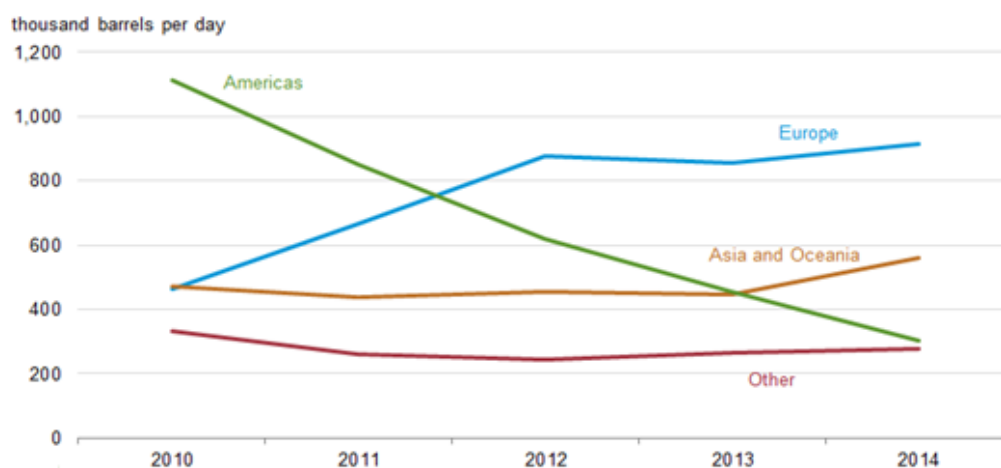
⁷⁹ OPEC, Annual Statistical Bulletin 2013, PG 10.

⁸⁰ OPEC, Member Countries' Crude Oil Production Allocations.



Source: U.S. Energy Information Administration, International Energy Agency⁸¹

Figure 11: Nigeria's Export of Crude Oil and Condensate, by Region from 2010-2014



Source: U.S. Energy Information Administration, International Energy Agency⁸²

In 2014, Nigeria exported 2.05 million bbl/d of crude oil and condensate. The United States was the largest importer of Nigerian oil until 2012, but the growth in U.S. light, sweet crude oil production has resulted in a sizable decline in US imports of crude grades of similar quality, such as Nigeria's crude oil. As supply to the US decreased, European imports increased, and presently Europe is the largest-regional importer of Nigerian oil, importing

⁸¹ U.S. Energy Information Administration (EIA) International Energy Agency Country Analysis: Nigeria, page 9. Retrieved from <http://www.eia.gov/countries/analysisbriefs/Nigeria/nigeria.pdf>

⁸² U.S. Energy Information Administration (EIA) International Energy Agency Country Analysis: Nigeria, page 11. Retrieved from <http://www.eia.gov/countries/analysisbriefs/Nigeria/nigeria.pdf>

slightly more than 900,000 bbl/d or 45% of the exports in 2014. This increase was also helped by the European embargo on Iranian crude imports, and supply disruptions in Libya.

Presently, the IOCs have various deep-water oil projects that have the potentials to bring online about 1.2 million bbl/d. The projects are listed below.

Table 1. Planned liquid fuels projects in Nigeria

Project name	Operator	Type	Plateau liquids production (000 bbl/d)	Final investment decision?	Est. start
Dibi Long-Term Project	Chevron	onshore oil	70	yes	2016
Sonam Field Development	Chevron	natural gas project	30	yes	2016
Gbaran-Ubie Phase Two Project	Shell	natural gas project	20	yes	2017
Erha North Phase 2	ExxonMobil	deepwater oil	60	yes	2018+
Egina	Total	deepwater oil	200	yes	2019+
Bonga Southwest and Aparo	Shell	deepwater oil	225	no	2020+
Bonga North	Shell	deepwater oil	100	no	2020+
Zabazaba-Etan	Eni	deepwater oil	120	no	2020+
Bosi	ExxonMobil	deepwater oil	140	no	2020+
Satellite Field Development Phase 2	ExxonMobil	deepwater oil	80	no	2020+
Uge	ExxonMobil	deepwater oil	110	no	2020+
Nsiko	Chevron	deepwater oil	100	no	2020+

Source: U.S. Energy Information Administration, International Energy Agency⁸³

Domestically, Nigeria consumed 305,000 bbl/d of petroleum in 2014. The country has four oil refineries with a combined capacity of 445,000 bbl/d, located at Port Harcourt (PH1 - 60,000bpsd, and PH2 - 150,000bpsd), Warri (125,000bpsd), and Kaduna(110,000bpsd).⁸⁴ Even though the nameplate capacity of the refineries exceed domestic demand, the refineries operate below capacity. The local refineries received a total of 36,193,237 barrels (4,917,613

⁸³ U.S. Energy Information Administration (EIA) International Energy Agency Country Analysis: Nigeria, page 6. Retrieved from <http://www.eia.gov/countries/analysisbriefs/Nigeria/nigeria.pdf>

⁸⁴ NNPC website. Retrieved from <http://www.nnpcgroup.com/NNPCBusiness/MidstreamVentures/RefineriesPetrochemicals.aspx>

mt) of (dry) crude oil, condensate and slops and processed 35,233,126 barrels (4,761,496 mt) into various petroleum products. The total production output by the refineries was 5,067,501 metric tons of various petroleum products, putting the combined average refining capacity utilisation for year 2013 at 22% as against 21% in the 2012.⁸⁵ In order to meet the domestic demand, the country had to import 164,000bbl/d of petroleum products.⁸⁶

Figure 12: Downstream Oil Industry Pipeline network in Nigeria



Source: Oando⁸⁷

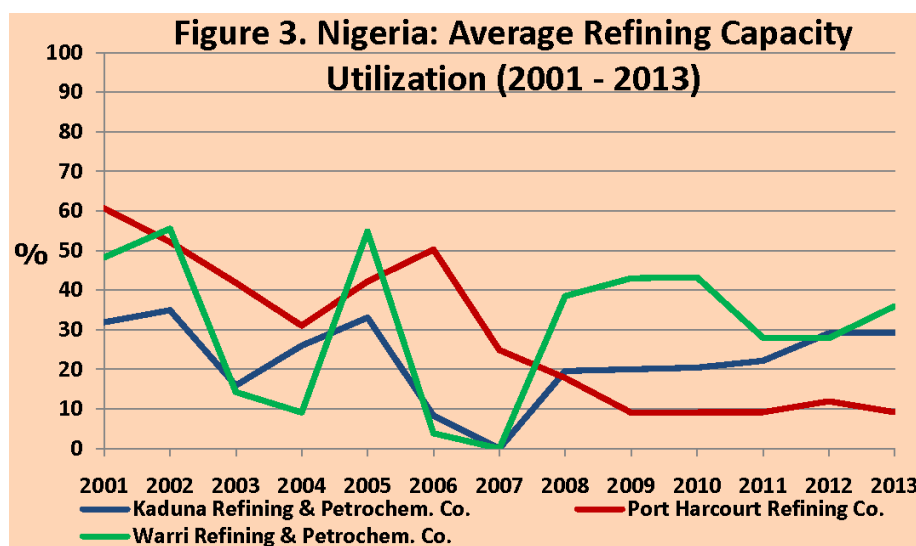
An indigenous company, Dangote Group, plans to construct the largest refinery in Africa at Lagos, with a capacity of 500,000 bbl/d refinery, and at the cost of \$11billion (it also includes petrochemical and fertilizer plants). The project is expected to come online between late 2017 and mid 2018, it will help Nigeria cut its reliance on international markets for petroleum products. The draft PIB also proposes the privatization of the refining sector and liberalisation of domestic fuel prices by removing subsidies.

Figure 13: Average Refining Capacity Utilisation from 2001-2013, Nigeria

⁸⁵ Nigerian National Petroleum Corporation, Annual Statistics Bulletin, (2013). Retrieved from <http://www.nnpcgroup.com/Portals/0/Monthly%20Performance/2013%20ASB%201st%20edition.pdf>

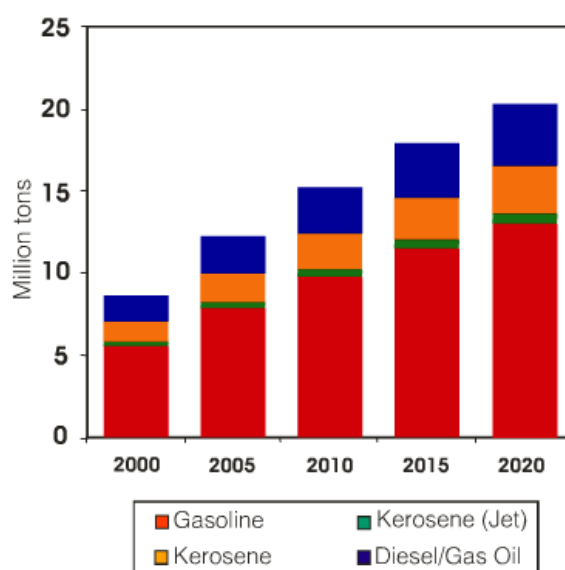
⁸⁶ Secretariat of the Organization of the Petroleum Exporting Countries, OPEC Annual Statistical Bulletin 2014, page 59. Retrieved from http://www.opec.org/opec_web/static_files_project/media/downloads/publications/ASB2014.pdf

⁸⁷ Oando, Industry Review. Retrieved from <http://www.oandopl.com/oando-refining/industry-overview/>



Source: NNPC⁸⁸

Figure 14: Petroleum products Demand in Nigeria



Source: OandO⁸⁹

5.2.2. Natural Gas

Natural gas is one of Earth's cleanest and most abundant energy sources. Nigeria is ranked as the ninth-largest natural gas reserve holder in the world and largest in Africa with an

⁸⁸ Nigerian National Petroleum Corporation, Annual Statistics Bulletin, (2013). Retrieved from <http://www.nnpcgroup.com/Portals/0/Monthly%20Performance/2013%20ASB%201st%20edition.pdf>

⁸⁹ OandO, Industry Review. Retrieved from <http://www.oandopl.com/oando-refining/industry-overview/>

estimated 180 trillion cubic feet (Tcf) of proved natural gas reserves as of January 2015.⁹⁰ Despite these proved natural gas reserves, mostly located in the Niger Delta, significant amount of Nigeria's gross natural gas production is flared (burned off) due to a lack of infrastructure needed to capture the natural gas produced with oil, known as associated gas. According to the OPEC, Nigeria only produced 1.35 Tcf of dry natural gas in 2013, consumed 36% of its gross production (490 billion cubic feet (Bcf)), flared 15% (428 Bcf) (203Bcf), and exported the rest.⁹¹

Table 2. Planned natural gas projects in Nigeria

Project name	Operator	Plateau natural gas production (MMcf/d)*	Final investment decision?	Est. start
Sonam Field Development	Chevron	215	yes	2016
Forcados Yokri Integrated Project**	Shell	65	yes	2017
Southern Swamp Associated Gas**	Shell	45	yes	2017
Gbaran-Ubie Phase Two Project	Shell	800	yes	2017
Bonga Southwest and Aparo	Shell	15	no	2020+
Bonga North	Shell	60	no	2020+
Bosi	ExxonMobil	260	no	2020+
Uge	ExxonMobil	20	no	2020+

*MMcf/d is million cubic feet per day.

**Units are in barrels of oil equivalent per day (boe/d).

Source: U.S. Energy Information Administration, International Energy Agency⁹²

When crude oil is produced from wells, raw natural gas associated with the oil is produced to the surface as well, and in countries lacking gas transportation infrastructure, vast amounts of such associated gas are commonly flared as waste or unusable gas. According to the U.S. National Oceanic and Atmospheric Administration (NOAA), natural gas flared in Nigeria accounted for 16.3% of the total amount flared globally in 2007, but has since dropped to

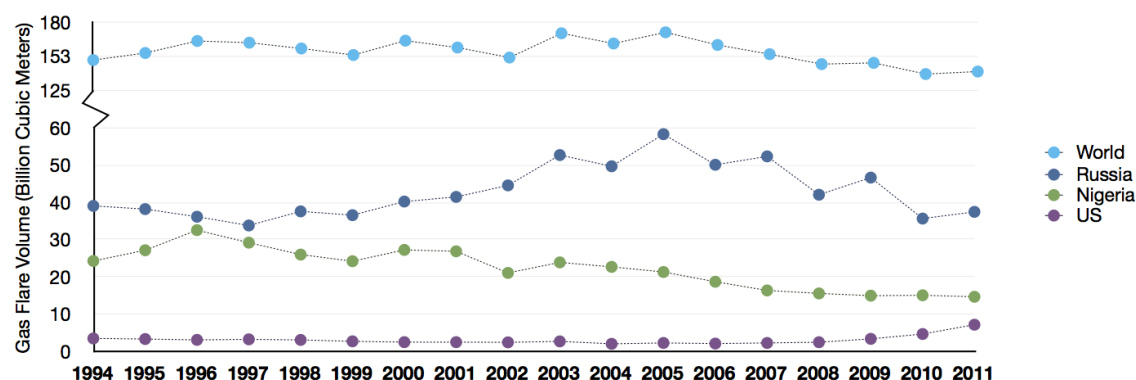
⁹⁰ Oil & Gas Journal, Worldwide Look at Reserves and Production, (January 1, 2015). Retrieved from <http://www.ogj.com/articles/print/volume-112/issue-1/drilling-production/worldwide-look-at-reserves-and-production.html>

⁹¹ Secretariat of the Organization of the Petroleum Exporting Countries, OPEC Annual Statistical Bulletin 2014, page 31. Retrieved from http://www.opec.org/opec_web/static_files_project/media/downloads/publications/ASB2014.pdf

⁹² U.S. Energy Information Administration (EIA) International Energy Agency Country Analysis: Nigeria, page 14. Retrieved from <http://www.eia.gov/countries/analysisbriefs/Nigeria/nigeria.pdf>

14.6% in 2013. The figures also show that the amount of gas flared in Nigeria has actually decreased in recent years, from 540 Bcf in 2010 to 428 Bcf in 2013.

Figure 15: Gas Flaring Volume in 2011



Source: Resilience.org⁹³

There is no clear sign that the Nigerian government plans to end gas flaring in the country anytime soon, as the IOCs have severally defied penalties on this issue, and new deadlines are repeatedly postponed by the government. Gas flaring has been estimated to cost Nigeria over \$2 billion (about N320 billion) annually in revenue that would have accrued had the gas been captured, refined and sold. This is in addition to the danger it poses to the citizens, animals plants, and the environment. In addition, Nigeria lost N12.38bn from non-imposition of penalties on IOCs for gas flaring from January to October of 2012, i.e., Chevron would have paid N4.61bn, Shell N2.55bn, Mobil N1.22bn, Agip N1.02bn, Total N785.56m, and Texaco N45.28m, based on the new penalty rate of N558.25 per scf.⁹⁴

As part of Nigeria's resolve to become a major international player in the international gas market, as well as to lay a solid framework for gas infrastructure expansion within the domestic market, the Nigerian Gas Master Plan was approved on February 13 2008. The Master Plan was developed to promote investment in pipeline infrastructure and new gas-fired power plants. This will help reduce gas flaring and also provide gas to fuel much-needed electricity generation in the country. The Master-Plan is a guide for the commercial exploitation and management of Nigeria's gas sector. It aims to stimulate the multiplier effect

⁹³ Resilience.org, Gas Flaring: The Burning Issue by by Zoheir Ebrahim and Jörg Friedrichs. Retrieved from <http://www.resilience.org/stories/2013-09-03/gas-flaring-the-burning-issue>

⁹⁴ NNPC, OPEC, and BusinessDay, Nigeria Gas flared and Cost Implications, July 30, 2014. Retrieved from <http://businessdayonline.com/2014/07/nigeria-gas-flared-and-cost-implication/#>

of gas in the domestic economy; position Nigeria competitively in high value export markets; and guarantee the long-term energy security of Nigeria.

5.2.2.1. Gas-To-Liquids (GTL)

Gas-to-liquids (GTL) is a technology that enables the production of clean-burning diesel fuel, liquid petroleum gas and naphtha from natural gas. The GTL process enables natural gas to be transformed into superclean diesel fuel. With the expected rise in demand for diesel, GTL technology provides an option to make a fuel with qualities that can enable significant reductions in emissions. A Chevron-operated Escravos GTL project is currently underway, with Chevron (75%) and NNPC (25%) jointly developing the \$10 billion facility. When completed, the plant will be able to convert 325 MMcf/d of natural gas per day into 33,000 barrels of liquids, i.e., clean-burning and low-sulfur diesel fuel for cars and trucks. The project started small-scale production in mid-2014, but full production is expected to start in mid-2015.⁹⁵

5.2.2.2. Liquefied Natural Gas (LNG)

Majority of the natural gas produced in Nigeria is exported in the form of Liquefied Natural Gas (LNG). Nigeria LNG Limited (NLNG) was incorporated on May 17, 1989, to harness Nigeria's vast natural gas resources and produce Liquefied Natural Gas (LNG) and Natural Gas Liquids (NGLs) for export. It is jointly owned by the NNPC (49%), Shell Gas B.V. (25.6%), Total LNG Nigeria Ltd (15%), and Eni International (10.4%).⁹⁶ Six liquefaction units (LNG trains) producing 22 million metric tonnes of LNG per year (mmtpa) are operated by the company, amounting to around 10% of the world's LNG consumption. The LNG facility on Bonny Island is Nigeria's only operating LNG plant. The company has 2 wholly-owned subsidiaries, Bonny Gas Transport (BGT) Limited which provides shipping services for NLNG, and Nigeria LNG Ship Manning Limited (NSML), which manages the personnel for its maritime business.⁹⁷

⁹⁵ Chevron, Nigeria Portfolio, Exploration and Production, (May 2014) and Chevron 2014 Annual Report Supplement, page 25. Retrieved from

<http://www.chevron.com/documents/pdf/chevron2014annualreportsupplement.pdf>

⁹⁶ NLNG website, Shareholders. Retrieved from <http://www.nigerialng.com/PageEngine.aspx?&id=43>.

⁹⁷ NLNG website, Background. Retrieved from <http://www.nigerialng.com/PageEngine.aspx?&id=35>.

The base projects, Trains 1 and 2, were financed by the shareholders at the cost US\$3.6 billion, while Train 3 which was funded by the shareholders and revenue from the base project cost US\$1.8 billion. Subsequently, Trains 4 & 5 cost US\$2.1 billion and was funded by a combination of internally generated revenue and third-party loans; and Train 6, funded solely by the shareholders, cost US\$1.748 billion.⁹⁸ With the six trains operational, the facility is capable of producing 22 Metric Tonnes Per Annum (MTPA) of LNG and 5 Metric Tonnes Per Annum (MTPA) of NGLs (LPG and Condensates) from 3.5 Billion (Standard) Cubic Feet Per Day (bcf/d) natural gas intake. Plans for building Train 7 that will lift the total production capacity to 30 mtpa of LNG are currently progressing with some preliminary early site preparation work initiated. Further work will await a Final Investment Decision by the shareholders.⁹⁹

Nigeria exported about 800 Bcf of LNG in 2013, ranking Nigeria among the world's top five LNG exporters, along with Qatar, Malaysia, Australia, and Indonesia.¹⁰⁰ According to the OPEC Annual Statistical Bulletin, Nigeria's exports are estimated at 866 Bcf in 2013, and accounted for about 7% of globally traded LNG. Japan is the largest importer, and imported 23% of the total in 2013, followed by South Korea (17%) and Spain (14%). Japan's imports in 2013 were six times the 2010 level, and this is a result of the Fukushima nuclear incident in March 2011. Exports to Europe have decreased significantly from 67% in 2010, to 31% in 2013. Also, U.S. LNG imports from Nigeria have declined substantially due to the growing U.S. natural gas production. U.S. imports peaked at 57 Bcf in 2006 and then dropped to no importation in 2012, and then shot back up to 2.5Bcf in 2013.¹⁰¹

NLNG commenced the supply of LPG to the Nigerian domestic market in 2007. This initiative started as part of NLNG's commitment to contribute significantly to the stimulation of the domestic LPG sector, and to help overcome gross shortage of the product in Nigeria at that point. The scheme commenced with the dedication of 150,000 Metric Tonnes Per

⁹⁸ NLNG website, Financing the Plant. Retrieved from <http://www.nigerianlng.com/PageEngine.aspx?&id=114>.

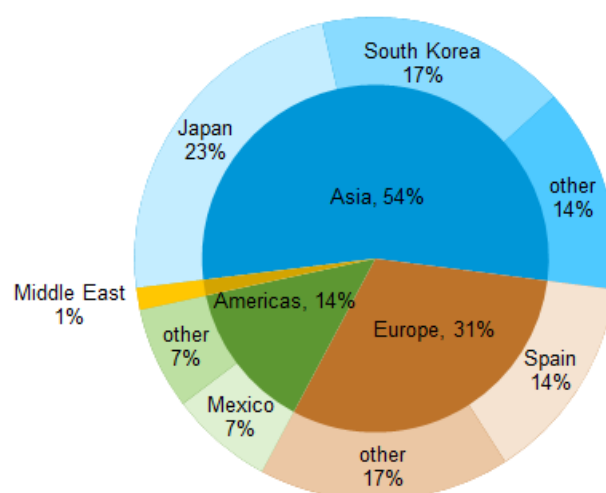
⁹⁹ NLNG website, Commercial Capacity. Retrieved from <http://www.nlng.com/PageEngine.aspx?&id=37>.

¹⁰⁰ BP, Statistical Review of World Energy, Excel workbook of historical data, 2014. Retrieved from <http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy/statistical-review-downloads.html>.

¹⁰¹ BP, Statistical Review of World Energy, Excel workbook of historical data, 2014. Retrieved from <http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy/statistical-review-downloads.html>.

Annum (mtpa) to the local market which was delivered to the Apapa jetty in December 2007. Since then, the NLNG domestic LPG scheme has enjoyed outstanding success with NLNG's intervention leading to a significant reduction in the end user price of LPG in Nigeria, as well as guaranteeing supply to the market to meet the high demand. This success has also led to the increase of the dedicated volume for the domestic market to 250,000 mtpa in 2013.¹⁰²

Figure 16: Nigerian LNG Exports, by Destination 2010.



Source: U.S. Energy Information Administration, International Energy Agency¹⁰³

Brass LNG Limited, a consortium made up of NNPC (49%), Total(17%), ConocoPhillips (17%), and ENI(17%), is developing the Brass LNG Liquefaction Complex. The LNG facility project is expected to have two liquefaction trains with a total capacity of 10 million metric tons of LNG per year (Mt/y), and is in the early engineering phase. Total is committed to purchasing about 20% of the plant's output for twenty years. About 70% of this offtake will be targeted at markets in Western Europe, while 30% goes to Asia.¹⁰⁴

5.2.3. Coal Energy

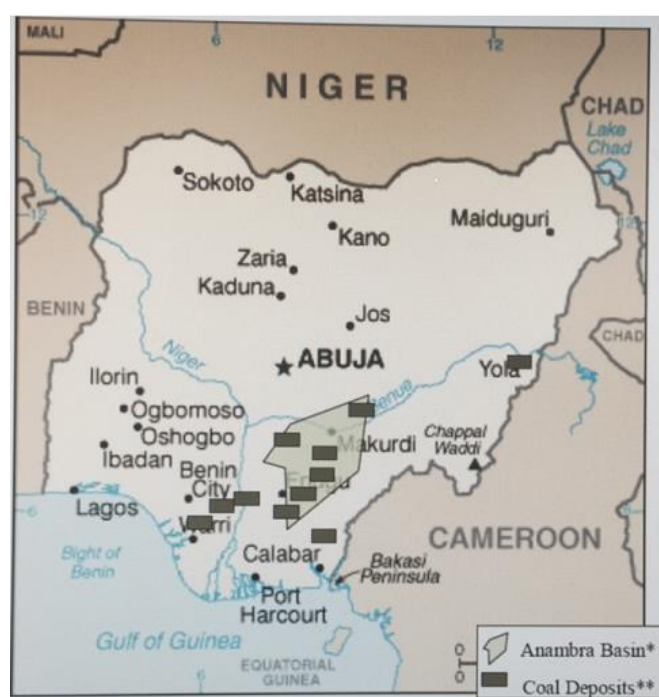
¹⁰² NLNG website, FAQs. Retrieved from <http://www.nigeriainlg.com/PageEngine.aspx?&id=121>

¹⁰³ U.S. Energy Information Administration (EIA) International Energy Agency Country Analysis: Nigeria, page 15. Retrieved from <http://www.eia.gov/countries/analysisbriefs/Nigeria/nigeria.pdf>

¹⁰⁴ Total, The Brass LNG Project (Nigeria). Retrieved from <http://www.total.com/en/energies-expertise/oil-gas/exploration-production/projects-achievements/liquefied-natural-gas-projects/brass-lng-project-nigeria?%FFbw=kludge1%FF>

Coal is a major source of energy, and has played this important role for centuries – not only providing electricity, but also as an essential fuel for steel and cement production, and other industrial activities. It is the most widely available and abundant fossil fuel resource in the world, and this provides energy security to many countries since its supply will last longer than gas or oil. Coal can be found in several parts of Nigeria. The largest and most economically viable coal deposits is in the Anambra Basin, which covers an area of approximately 1.5million hectares. The Basin is subdivided into the following Kogi, Benue, Enugu, Inyi, Afikpo, Lafia Obi, Gombe, and Asaba lignite Districts.¹⁰⁵

Figure 16: Nigeria's Coal Fields



Source: Global Methane¹⁰⁶

Coal was discovered in Enugu in 1909, and the Ogbete drift mine opened six years later. Its operations and others in the country were merged into the Nigerian Coal Corporation (NCC) in 1950.¹⁰⁷ The NCC was then tasked with exploiting coal resources, and held a monopoly on coal and coke mining, production, and sales. The development of the industry suffered once oil was discovered, as the Nigerian Railway Corporation (NRC) and the Electricity Corporation of Nigeria (ECN) switched to diesel-powered engines for their trains and power

¹⁰⁵ MMSD 2010, Coal: Exploration and Power Generation Opportunities in Nigeria.

¹⁰⁶ Global Methane, Nigeria: Summary of Coal Industry. Retrieved from https://www.globalmethane.org/documents/toolsres_coal_overview_ch24.pdf

¹⁰⁷ MMSD 2010, Coal: Exploration and Power Generation Opportunities in Nigeria.

plants, and furthermore, the Civil War caused many mines to be abandoned. Following the war, production never completely recovered, and attempts at mechanizing production ended badly.

Nigeria still holds large coal reserves, estimated to be at least 2 billion metric tonnes. The discovery of bituminous coal suitable for use in coke production for the iron and steel industries also opened up new domestic markets. With the loss of its largest domestic consumers, the NCC began exporting coal to Italy and the United Kingdom, as its low sulphur content was desirable. In 1999, the government started allowing private companies to operate coal fields in joint ventures with the NCC. The intention of the Nigerian government was to retain 40% of the assets, and sell 40% to private investors and 20% to the Nigerian public, while retaining 40%. In 2002, work stopped at NCC-operated mines and in 2003, the Nigerian government announced plans to create a technical advisory committee that would be tasked with reviving the industry. The Nigerian Bureau of Public Enterprises (BPE) still lists the NCC as an asset for sale, but no news reports to date provide any information about the supposed sale.

Table 3: Nigerian Coal Mines

Mine	Coal Type	Estimated Reserves (million tonnes)	Proven Reserves (million tonnes)	Depth of Coal (m)	Mining Methods (Surface or Underground)
Okpara	Sub-bituminous	100	24	180	Underground
Onyeama	Sub-bituminous	150	40		Underground
Ihioma	Lignite	40	N/A	20–80	Surface
Ogboyoga	Sub-bituminous	427	107	20–100	Surface and Underground
Ogwashi Azagba/Obomkpa	Lignite	250	63	15–100	Surface and Underground
Ezimo	Sub-bituminous	156	56	30–45	Surface and Underground
Inyi	Sub-bituminous	50	20	25–78	Surface and Underground
Lafia/Obi	Bituminous (cokable)	156	21.42	80	Underground
Oba/Nnewi	Lignite	30	N/A	18–38	Underground
Afikpo/Okigwe	Sub-bituminous	50	N/A	20–100	Underground
Amasiodo	Bituminous	1,000	N/A	563	Underground
Okaba	Sub-bituminous	250	73	20–100	Surface and Underground
Owukpa	Sub-bituminous	75	57	20–100	Surface and Underground

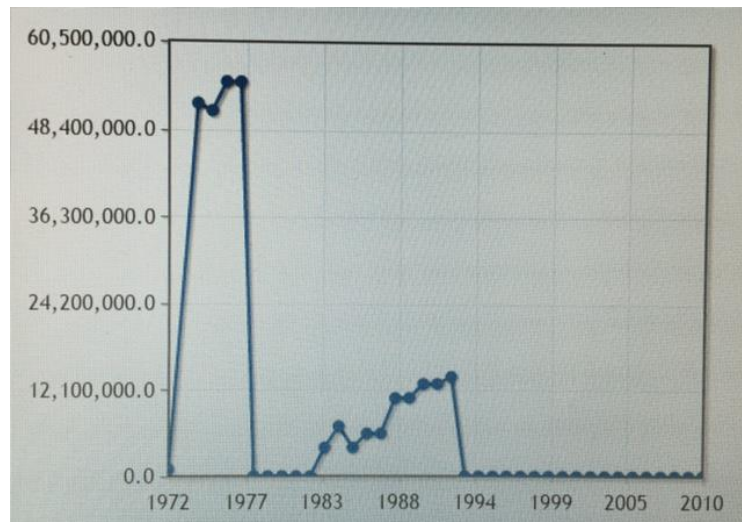
Ogugu/Awgu	Sub-bituminous	N/A	N/A	N/A	Underground
Afuji	Sub-bituminous	N/A	N/A	N/A	Underground
Ute	Sub-bituminous	N/A	N/A	N/A	Underground
Duho	Sub-bituminous	N/A	N/A	N/A	Underground
Kurumu	Sub-bituminous	N/A	N/A	N/A	Underground
Lamja	Sub-bituminous	N/A	N/A	N/A	Underground
Garin Maigunga	Sub-bituminous	N/A	N/A	N/A	Underground
Gindi Akwati	Sub-bituminous	N/A	N/A	N/A	Underground
Janata Koji	Sub-bituminous	N/A	N/A	N/A	Underground

Source: Global Methane¹⁰⁸

The Nigerian government has recognized the need to revitalize the country's coal mining industry to provide fuel for power generation and domestic use. Steam coal, also known as thermal coal, is used to generate electricity, and with clean coal technologies, we can use the huge coal deposit yet to be tapped in Nigeria to boost the electricity sector. Using coal as an alternative source of power generation will enable Nigeria to reach and surpass its targets for the power sector as entrenched in the National Energy Policy. It is expected that coal from the Districts can support coal-fired power plants with total capacity of between 15,000MW-20,000MW.

Figure 17: Electricity Production from Coal in Nigeria (kWh)

¹⁰⁸ Global Methane, Nigeria: Summary of Coal Industry. Retrieved from https://www.globalmethane.org/documents/toolsres_coal_overview_ch24.pdf



Source: Index Mundi¹⁰⁹

In 2012, Astra Resources Plc concluded an initial geological investigation and feasibility study in Nigeria to determine the coal potential and viability of two coal sites within the Ogboyoga coal field of the Kogi District. The results indicated the existence of a total coal tonnage of 31.35million tonnes in the 16.2 square kilometre area. The coal was found to be low in sulphur and ash, and high in calorific value making it ideal for power generation, as well as for exportation into the international market. Astra has stated that in addition to the potentials of the venture, the incentives available to foreign investors in Nigeria makes the “opportunity a perfect fit with Astra’s low risk business model.”¹¹⁰

5.2.4. Electricity

5.2.4.1. General Overview

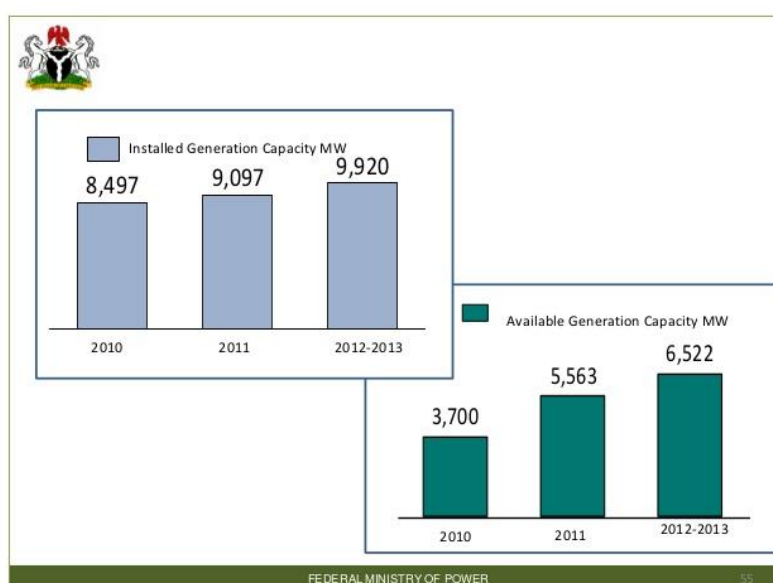
Electricity is essential for economic growth, national development, and improved standard of living for citizens of every country, and all the forms of energy already discussed can be transformed to electricity. Despite the abundance of energy resources in Nigeria, electricity generation is mainly from large hydro, natural gas, LPFO and diesel, and the supply is far short of demand.

¹⁰⁹ Index Mundi, Nigeria: Electricity production from coal sources. Retrieved from <http://www.indexmundi.com/facts/nigeria/electricity-production-from-coal-sources>

¹¹⁰ Proactiveinvestors. Retrieved from <http://www.proactiveinvestors.com.au/companies/news/25509/-astra-resources-uncovers-new-growth-opportunity-in-nigerian-coal--25509.html>

In Nigeria, electricity generation started from few kilowatts that were used in Lagos by the colonial masters when the first generating plant was installed in 1898. By the Act of Parliament in 1951, the Electricity Corporation of Nigeria (ECN) was established. In 1962, the Niger Dams Authority was set up to develop hydroelectricity, and it was later merged with ECN in 1972 to form the National Electric Power Authority (NEPA). NEPA operated a monopolized market until 2001, when the National Electric Power Policy (NEPP) was introduced to kick-off the power sector reform and several other reforms.

Figure 18: Generation capacity in Nigeria, 2014.

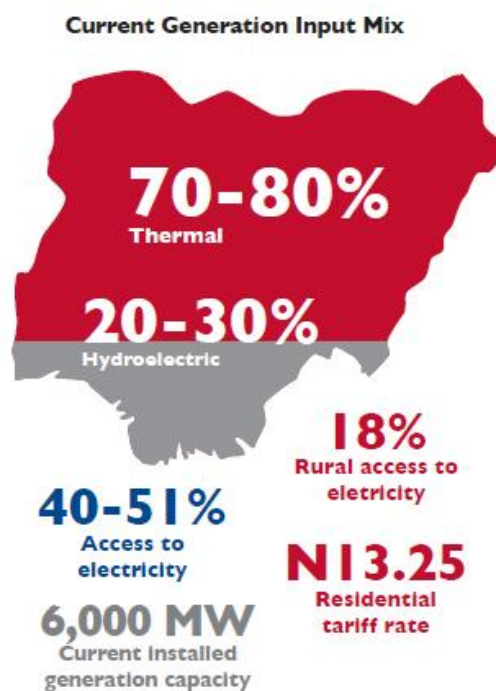


Source: Federal Ministry of Power¹¹¹

In 2012, Nigeria's installed generation capacity was 6,090 megawatts (MW) in 2012 (pre-privatization), of which 3,960MW (65%) was from fossil fuel sources, 2,040 MW (33%) was from hydro sources, 88MW from biomass and waste (1%), and 2 MW (<1%) from wind. The local demand is estimated at 15GW, while total installed generation capacity is 8GW. Peak generation is presently at an average of 4GW/day, generation for international commitments stand at 300MW, and the maximum capacity of the national grid is 5GW thereby leaving about 2GW stranded. This may also attributed to inadequate gas supply, bad water management, and inefficient distribution network.

Figure 19: Data for Electricity Sector

¹¹¹ FMoP. Retrieved from <http://image.slidesharecdn.com/ministryofpower-130723082504-phpapp01/95/ministry-of-power-55-638.jpg?cb=1374585942>



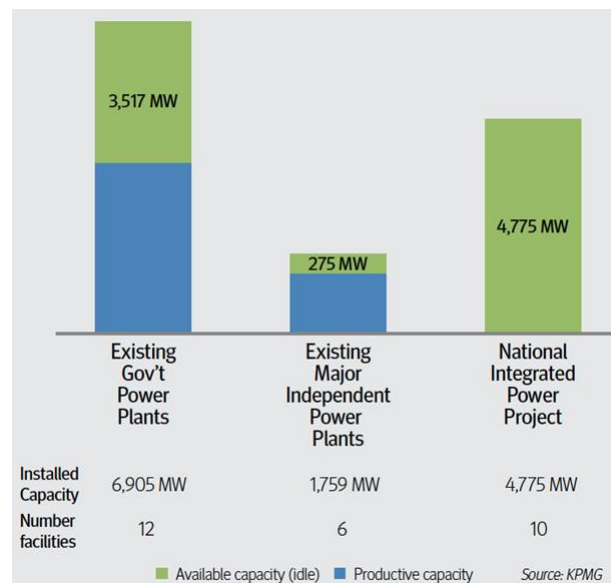
Sources: NERC

Nigeria's power sector suffers from poor maintenance of electricity facilities, unavailability of natural gas supply, bad water management, high technical losses from concentration of power plants in the south, non-diversification of sources, high commercial losses due to poor collection mechanisms, and an obsolete/inadequate transmission and distribution networks. Due to these factors, stranded power is presently estimated to be about 2GW daily.

Nigeria has one of the lowest rates of net electricity generation per capita in the world. Only about 41% of the population have access to grid electricity. The 18% with access are located in the rural areas, where about 70% of the population reside.¹¹² Those with access to electricity (private, commercial and industrial) have to regularly experience load shedding, and blackouts, which cause them to rely heavily on private generators as back-ups. Most have even disconnected themselves from the grid in order to operate their own isolated system.

Figure 20: Nigeria's Installed and Available Capacity

¹¹² African Development Fund, "Project Appraisal Report: Partial Risk Guarantee in Support of the Power Sector Privatizations," (December 2013), pages 1-8.



Source: Doing Business¹¹³

On November 1, 2013, the reform and privatization efforts of the government achieved a milestone as the government-owned utilities were officially handed over to the successful preferred bidders, part of the objectives of the Act. The private companies took physical ownership of the generation and distribution infrastructure and the responsibility of improving/repairing the system. The federal government retained 40% of the distribution companies, 100% of the transmission company (being managed by Manitoba Hydro International), and 100% of the three (3) hydropower plants (given to private companies under concession). The federal government is in the process of privatizing the power plants constructed under the National Integrated Power Projects (NIPP). The project includes 10 generation plants, 110 transmission infrastructure, and 250 distribution projects, as well as gas projects at nine of the power plants.¹¹⁴ The privatization process for the ten power plants started last year, and will be concluded soon, and hand-over thereafter to the preferred bidders. Nigeria has set ambitious goals to increase generation capacity to more than 20,000 MW by 2020.

Figure 21: Structure of the Electricity Sector

¹¹³ Doing Business in. Retrieved from <http://www.doingbusinessin.fr/wp-content/uploads/2013/09/power42.png>

¹¹⁴ NDPHC. Retrieved from http://ndphc.net/?page_id=2900 & http://ndphc.net/?page_id=3429



Source: FMoP¹¹⁵

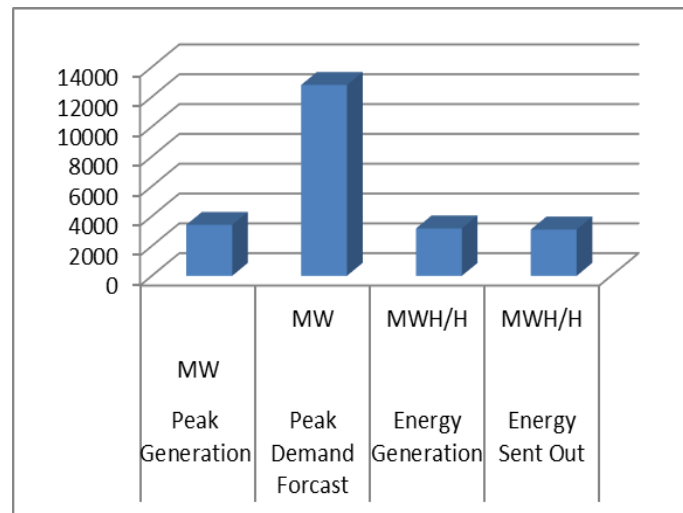
The power sector in Nigeria is divided into three major parts, the Generation, Transmission, and Distribution subsectors.

5.2.4.2. Generation

The splitting of the power sector led to the formation of Nigerian Electricity Supply Industry (NESI). The generation segments of the Nigerian power sector are divided into the six (6) successor generation companies (6) created from NEPA and recently privatized by the FG, Independent Power Producers (IPPs) constructed, owned and managed by the private sector, and ten (10) plants under the National Integrated Power Projects (NIPP). All the above mentioned plants have been issued with the appropriate Licences by NERC pursuant to Section 62 of the EPSR Act.

Figure 22 Nigerian Power Generation Report

¹¹⁵ FMoP. Retrieved from <http://image.slidesharecdn.com/ministryofpower-130723082504-phpapp01/95/ministry-of-power-8-638.jpg?cb=1374585942>



Source: PTFP & Electric Power Forum¹¹⁶

A priority for the Nigerian authorities presently is to balance out the production palette, which currently relies solely on hydroelectric and thermal sources. First signs of diversification are appearing as the Commission has issued several licences to companies intending to generate power with coal. Nuclear energy is also being considered, despite doubts given the enormity of financial resources, required skills, and the availability of the technology locally. Solar energy's commercial deployment remains limited for the short to medium term. According to the government's master plan, it is projected to account for about 8.3% of generating capacity by 2030. Nigeria remains very richly endowed with renewable energy resources that remain hugely untapped. Biomass, wind, solar, geothermal and ocean energies are available but still not explored or limited to pilot and demonstration projects.

Figure 23: Existing Power Plants connected to the National Grid (2014)

¹¹⁶ Electric Power forum. State of Power Generation in Nigeria. Retrieved from <http://electricpowerforum.com.ng/?p=210>



Source: FMoP¹¹⁷

Figure 24: Newly Completed/Ongoing Generation Projects (2014)



Source: FMoP¹¹⁸

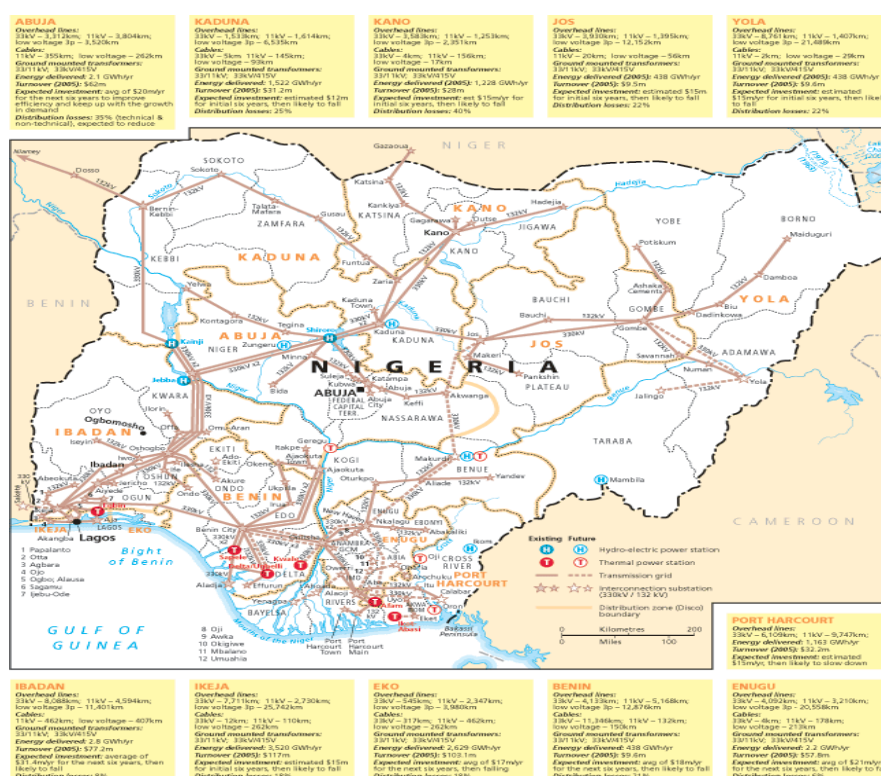
5.2.4.3. Transmission

¹¹⁷ FMoP. Retrieved from <http://image.slidesharecdn.com/power-141124035719-conversion-gate01/95/ministerial-press-briefing-2014-presentation-by-the-minister-of-power-prof-nebo-20-638.jpg?cb=1416823291>

¹¹⁸ FMoP. Retrieved from <http://image.slidesharecdn.com/power-141124035719-conversion-gate01/95/ministerial-press-briefing-2014-presentation-by-the-minister-of-power-prof-nebo-21-638.jpg?cb=1416823291>

The transmission subsector remains a monopoly still owned by the FG, under the company known as the Transmission Company of Nigeria (TCN). The TCN is also a successor company of the defunct NEPA and PHCN, and performs the role of the Transmission Service Provider (TSP), System Operator (SO), and Market Operator (MO). As a TSP, it holds a Transmission Licence which empowers it to build and maintain the transmission system to supply power to all parts of the country.

Figure 25: Nigeria's Grid System



Source: Global Energy Network Institute¹¹⁹

TCN also holds a System Operations Licence which empowers it to be the SO and the MO. The SO is responsible for operating the transmission system in a safe and reliable manner in terms of planning, dispatch, operation and control. The SO is also responsible for the overall security and reliability of the grid system. The transmission networks spreads to all parts of the country and across the border, and is made up of a National Control Centre (NCC) in Oshogbo, three (3) Regional Control Centers (RCC) at Shiroro, Ikeja and Benin, eight (8) Regional Operations Coordinating units (ROCs) at Benin, Enugu, Port Harcourt, Bauchi,

¹¹⁹ Global Energy Network Institute, Nigerian national Electricity Grid. Retrieved from http://www.geni.org/globalenergy/library/national_energy_grid/nigeria/nigeriannationalelectricitygrid.shtml

Kaduna, Shiroro, Oshogbo, and Lagos, and several Area Control Centres. Proposed RCCs are planned for Kano, Alaoji, and Gombe.¹²⁰ The MO, on the other hand, is responsible for implementing and administering the Market Rules and Procedures, including administration of the Commercial Metering System, Market Settlement System and Payment System, as well as the commercial arrangement of the energy market.

The EPSR Act though, contemplates that when the electricity market is fully developed, the System Operations Licence and operations may be transferred to an Independent System Operator (ISO) separate from TCN. It is also envisaged that the MO may also become autonomous and separate from the TCN as the market develops. TCN is currently being managed by a Management Contractor, Manitoba Hydro International (Canada) responsible for revamping it to achieve technical and financial adequacy in addition to providing stable transmission of power without system failure.

Figure 26: Future Transmission Expansion in Nigeria



**Blue lines – Present network*

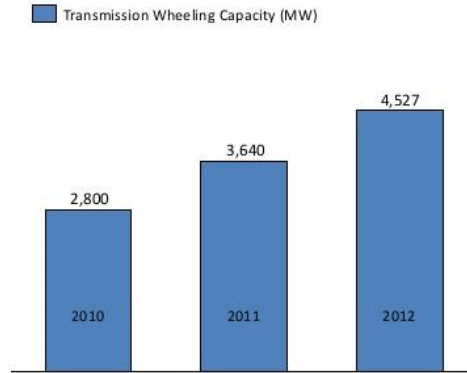
***Red lines – Future expansion*

Source: Ministry of Power¹²¹

Figure 27: Transmission Wheeling Capacity of TCN, 2014

¹²⁰ The Nigerian Electricity System Operator. Retrieved from <http://www.nsong.org/AboutUs/History.aspx>

¹²¹ Federal Ministry of Power. Retrieved from <http://image.slidesharecdn.com/ministryofpower-130723082504-phpapp01/95/ministry-of-power-66-638.jpg?cb=1374585942>

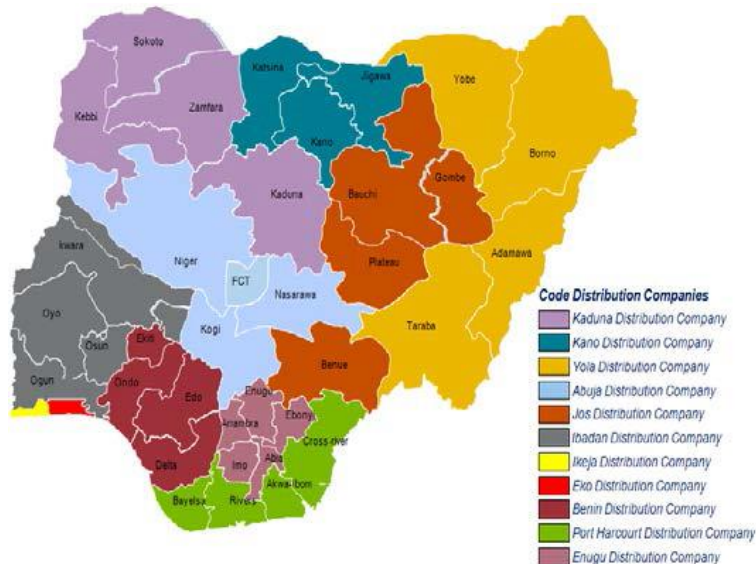


Source: Federal Ministry of Power¹²²

5.2.4.4. Distribution

The third sub-sector is distribution which comprises of eleven (11) electricity distribution companies (DISCOS), namely Abuja Distribution Company, Benin Distribution Company, Eko Distribution Company, Enugu Distribution Company, Ibadan Distribution Company, Ikeja Distribution Company, Jos Distribution Company, Kaduna Distribution Company, Kano Distribution Company, Port Harcourt Distribution Company, and Yola Distribution Company.

Figure 28: The Distribution Zones in Nigeria



*Ekiti State is serviced by Ibadan and Benin Distribution Company

Source: KPMG¹²³

¹²² FMoP. Retrieved from <http://image.slidesharecdn.com/ministryofpower-130723082504-phpapp01/95/ministry-of-power-57-638.jpg?cb=1374585942>

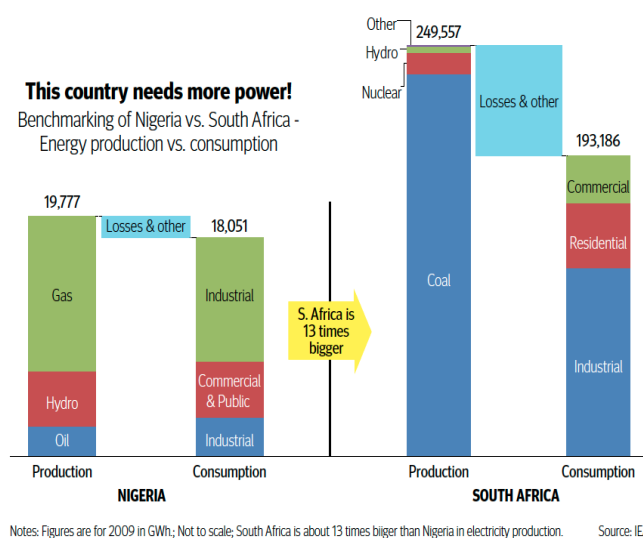
¹²³ KPMG. Retrieved from <http://www.kpmg.com/Africa/en/IssuesAndInsights/Articles-Publications/Documents/Guide%20to%20the%20Nigerian%20Power%20Sector.pdf>

5.2.4.5. The Energy Sector in Similar Countries

By comparison, South Africa, with a population of just 50 million, has an installed electricity generation capacity of over 52,000 MW. On a per capita consumption basis, Nigeria is ranked a distant 178th with 106.21 KWh per head – well behind Gabon (900.00); Ghana (283.65); Cameroon (176.01); and Kenya (124.68).¹²⁴

South Africa with a population of about 50million people, less than a third of the Nigerian population, but generates over 45,000 MW of electricity. Current rating of top 100 electricity producers in the world shows Nigeria 4th in Africa, and 70th in the world.¹²⁵ In Africa, South Africa has 238.3billion kWh, Egypt has 123.9, Algeria 40.11, Libya 26.95, and Nigeria has 20.13.¹²⁶ From the history of the countries in the top 5, it took them 30years of consistent and articulated planning and investments to reach that peak.

Figure 29: Benchmarking of Nigeria v. South Africa, 2009.



Source: Doing Business¹²⁷

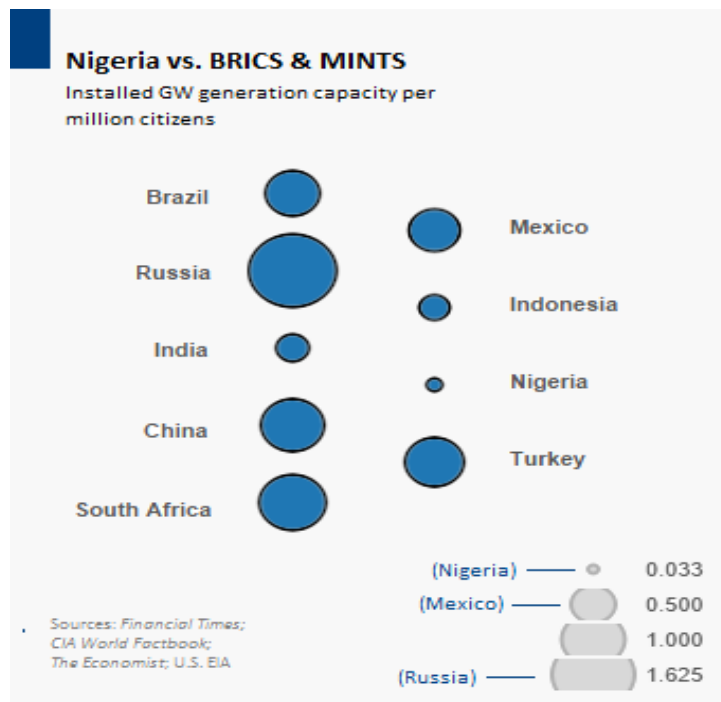
Figure 30: Comparing Generation Capacity of Nigeria and BRICS & MINTS

¹²⁴ Vanguard Newspaper. Retrieved from <http://www.vanguardngr.com/2013/02/the-challenges-of-the-nigerian-electric-power-sector-reform-1/#sthash.WJzorP71.dpuf>

¹²⁵ Farabale, Electricity Generation, January 4, 2015. Retrieved from <http://farabale.co/2015/01/04/electricity-generation-nigeria-4th-in-africa-70th-in-the-world/>

¹²⁶ Farabale, Electricity Generation, January 4, 2015. Retrieved from <http://farabale.co/2015/01/04/electricity-generation-nigeria-4th-in-africa-70th-in-the-world/>

¹²⁷ Doing Business in. Retrieved from <http://www.doingbusinessin.fr/wp-content/uploads/2013/09/power32.png>



Source: Huffington Post¹²⁸

5.2.5. Nuclear energy

Nigeria is interested in nuclear power as a source of stable electricity. The country has explored the possibility of developing a nuclear energy program since the 1970s and has recently made attempts to commission its first nuclear power plant. A roadmap developed by the Nigerian Atomic Energy Commission (NAEC) calls for 14,000 MW by 2027. There has been progress in some areas, including the ratification of international treaties, development of regulatory infrastructure, and signing of bilateral technical cooperation agreements. The challenges that remain include a substandard grid, underdeveloped electricity market, and lack of technical capacity.

In 2012, Nigeria initially signed an agreement with Rosatom to cooperate on the design, construction, operation and decommissioning of one nuclear facility. Now, negotiations are ongoing for the construction of as many as four nuclear power plants with a capacity of 1,200MW each at a cost of about \$80 billion. The project will be financed by Rosatom, who will build, own, operate and transfer the plants to the Nigerian government pursuant to the

¹²⁸ Huffington Post. Why Nigeria Generates so little power, by Timi Soleye. Retrieved from http://www.huffingtonpost.com/timi-soleye/why-nigeria-generates-so-_b_5695091.html

Power Purchase Agreement. It is expected that Rosatom will hold a majority (controlling) stake in the nuclear facilities, while a minority stake will be owned by Nigeria. The first plant is expected to be operational in 2025.¹²⁹ This will be a landmark project when commissioned as the only nuclear power station in the entire African continent is Koeberg which in South Africa, and is operated by state-owned Eskom Holdings SOC Ltd.

6. Sustainable energy

¹²⁹ Bloomberg Business. Nigeria in Rosatom Talks for Up to \$80 Billion Nuclear Power by Joseph Burite. Retrieved from <http://www.bloomberg.com/news/articles/2015-04-14/nigeria-signs-rosatom-deal-for-up-to-80-billion-nuclear-power>

6.1. Sustainable energy as a universal principle

The 2015 International Energy Charter recognises the importance of renewable energy sources and energy efficiency. Signatories to the International Energy Charter acknowledge the importance of efficient systems in the production, conversion, transport, distribution and use of energy for energy security, poverty alleviation, sustainable development and for the protection of the environment. They also agree to promote a more sustainable energy mix to minimise the negative environment consequences in a cost-effective manner by sharing best practices on clean energy development and investment.

6.2.1 Renewable energy sources

Nigeria has abundant indigenous energy resources aside from oil and gas, including hydro, coal, solar, geothermal, wind, nuclear and biomass, much of which is untapped. Social and economic development of the country will be accelerated through effective exploitation and utilisation of these resources. Based on that, the Nigerian government has put policies in place to encourage private sector participation in the development of these energy resources, especially for power generation to bridge the wide gap between demand and supply in the country, as well as regionally.

6.2.1.1 Hydropower

Nigeria is endowed with large and small rivers, streams, and some few natural falls, which exist within the present split of the country into eleven river basin authorities. Studies have shown that the country possesses potential hydro-energy resources along her waterways consisting of a total of 70 micro dams, 126 mini dams and 86 small sites.¹³⁰ According to the ECN, the total exploitable potential of the country's large hydropower is estimated at about 11,250 MW, and that of the small hydropower at 3500 MW. These rivers, waterfalls and streams with high hydropower potential, if properly harnessed will lead to decentralized use and can provide electricity to the grid, or be the most affordable and accessible option to off-grid electricity service especially to the rural communities.

Figure 31: Waterways in Nigeria

¹³⁰ Akpu, I.V. Renewable Energy Potentials in Nigeria. International Association for Impact Assessment.

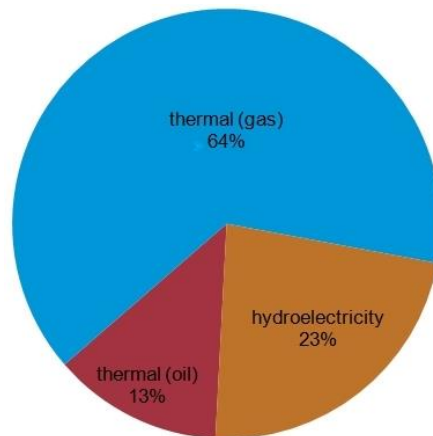


Source: Logistics Capacity Assessment¹³¹

Hydropower generation is an important option which can help to meet the growing demand for energy worldwide, especially Nigeria. It was first harnessed in 1962 by the Niger Dams Authority, but its total power contribution has declined in recent years. Presently, there are three (3) large hydroelectric power plants located at Kainji (completed in 1968 with an installed capacity of 760MW), Jebba (completed in 1984 with an installed capacity of 570MW), and Shiroro (completed in 1990 with an installed capacity of 600MW), and all constructed by the Federal Government. In addition, NESCO operates various small hydro plants in Jos, Plateau State with a total capacity of 30 MW. There are also some hydro projects in progress or almost completed. Electricity production from hydroelectric sources in Nigeria was last measured at 22.90 in 2009, with thermal (gas) at 64% and thermal (oil) at 13%.

Figure 32: Electricity Production from Hydro (% of total) in 2009

¹³¹ Logistics Capacity Assessment, Nigeria Waterway Assessment. Retrieved from <http://dlca.logcluster.org/display/public/DLCA/2.5+Nigeria+Waterways+Assessment;jsessionid=D1B5B222AC091772C76197CFFA8CD883>



Source: U.S. Energy Information Administration, International Energy Agency¹³²

Nigeria plans to increase hydroelectricity generation capacity to 5,690 MW by 2020, almost tripling the capacity from the 2012 level. Nigeria has large undeveloped hydro power potentials, some of which have been shown to be technically and economically viable. Some of these sites, indicated in Figure 33 below include Mambilla (3100MW), Ikom (730MW), Lokoja (1050MW), Zungeru (700MW), Makurdi (1062MW), Onitsha (1050MW), Gurara I (30MW), Gurara II (360MW), Itisi (40MW), Kashambilla (40MW), and Dadinkowa (39MW).¹³³ The Mambilla Power Station project will be one of Africa's and Nigeria's biggest dam and hydro power plant project, and will be connected to three dams across the Donga River in Taraba State. Conceived in 1982, the Dam has a potential of generating 3,960MW. Thus on November 7, 2012 Nigeria signed an MoU with China's Sinohydro Corp. to build the Mambilla Power Station. Once completed, it will multiply Nigeria's generating capacity considerably. It is one of several hydro projects that are part of Nigeria's Renewable Energy Master Plan (REMP), proposed in 2006, which seeks to increase the supply of renewable electricity – including wind, solar, biomass and small hydro – from 13% of total electricity generation in 2015 to 23% in 2025 and 36% by 2030. Furthermore, in late 2013, the Nigerian government announced a \$1.3 billion deal with China to build the 700MW Zungeru hydropower project. The Export-Import Bank of China will cover 75% of the cost, and the Nigerian government will finance the remaining amount. The project was initially scheduled

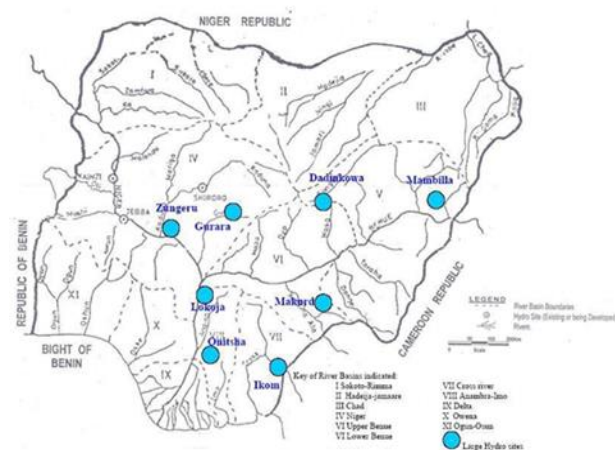
¹³² The Encyclopedia of Earth, The Energy Profile of Nigeria. Retrieved from <http://www.eoearth.org/view/article/152513/>

¹³³ Federal Ministry of Power. Retrieved from <http://image.slidesharecdn.com/ministryofpower-130723082504-phpapp01/95/ministry-of-power-16-638.jpg?cb=1374585942>

to be completed in 2017, but that date has been pushed back because of legal challenges that have delayed construction work.¹³⁴

In addition, the river basins in the country have potentials for small-scale hydropower, e.g., Chad Basin (Biu, Janga Dole, and Majeekin Dams), Upper Benue River Basins (Jada, Monkin, Kiri, Waya, and Dandinkowa Dams), Anambra–Imo River Basin (Igwu, Imo, and Ivo Rivers), Owena Benin River Basin (Owena, Ele, and Okhuanwan Rivers), and Ogun–Oshun River Basin (Oyan, Ikere Gorge, Lekan Are, Oke-Odan, Eniosa, Ofiki I, Ofiki II, Sepeteri I, Sepeteri II, Okuku, and Igbojaiye Dams).

Figure 33: Map showing the River Basins and locations of Hydropower Projects



Source: Federal Ministry of Power¹³⁵

The Federal Ministry of Power has also concluded bankable feasibility studies at the following dams: Oyan (10MW) in Ogun State, Ikere George (6MW) in Oyo State, Bakolori (3MW) in Zamfara State, Challawa (7.5MW) and Tiga (10MW) in Kano State, Kampe (3MW) in Kogi State, Owena (1MW) in Ondo State, Doma (1MW) in Nasarawa State, Zobe (1MW) in Katsina State, and Jibia (4MW) in Katsina State.¹³⁶

The Hydroelectric Power Producing Areas Development Commission Act 2010 establishes a Commission vested with powers to formulate policies and guidelines for the development of

¹³⁴ HydroWorld.com, "Nigeria's US\$1.3 billion 700-MW Zungeru hydroelectric project deals with challenges," (December 12, 2014). Retrieved from <http://www.hydroworld.com/articles/2014/12/nigeria-s-us-1-3-billion-700-mw-zungeru-hydroelectric-project-deals-with-challenges.html>

¹³⁵ Federal Ministry of Power. Retrieved from <http://image.slidesharecdn.com/ministryofpower-130723082504-phpapp01/95/ministry-of-power-21-638.jpg?cb=1374585942>

¹³⁶ Federal Ministry of Power. Retrieved from <http://image.slidesharecdn.com/ministryofpower-130723082504-phpapp01/95/ministry-of-power-17-638.jpg?cb=1374585942>

the hydroelectric power producing areas.¹³⁷ The Act which was subsequently amended was conceived to address the challenges faced by host communities of hydropower stations. HYPPADEC is expected to efficiently manage the ecological damage caused by the country's hydro-electric dams on the affected States.¹³⁸ The expenses of the Commission funded by a Fund made up of contributions by operators (10% of the total revenue generated from a hydroelectric dam), member states (25% of money due to the States from the Ecological Funds), the Commission (money raised through several means and proceeds from all other assets that may accrue to the Commission), and the Federal Government (appropriations from the National Assembly which shall be at least 50% of their annual budget).

6.2.1.2. Solar Energy

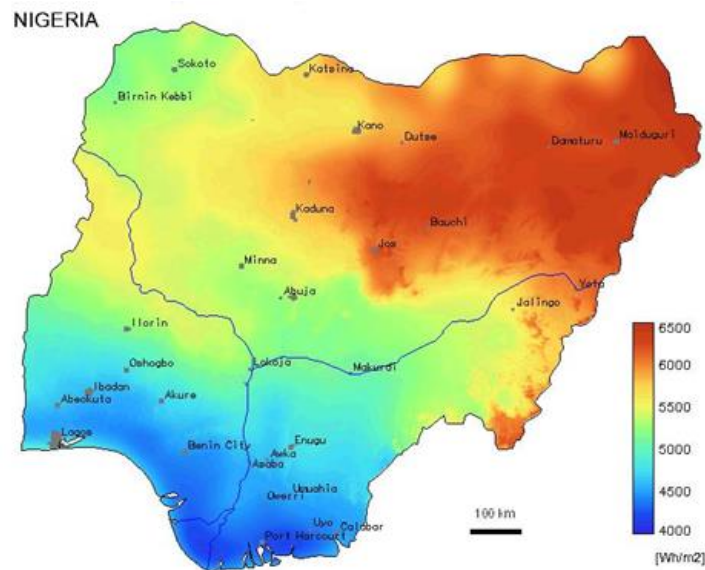
Among all the renewable energy resources available, solar is the most promising and dependable due to its apparent limitless potentials. Nigeria is located favourably within a high sunshine belt, and solar radiation is well distributed within the country. The intensity of solar radiation exhibits remarkable variation from the northern region to the southern region but is higher in the northern region. The daily solar radiation varies from 7.2kW/m²/day in the north to 4kW/m²/day in the south, and an average of 9hrs of daily sunshine hours in the north to 4 hours in the south. With an average radiation level of about 19.8 MJ/m²/day, solar energy may be harnessed in the form of solar photovoltaic electricity or in the form of thermal energy.¹³⁹

¹³⁷ Hydroelectric Power Producing Areas Development Commission (Establishment, ETC,) Act No 87 of 2010. Retrieved from <http://faolex.fao.org/docs/pdf/nig120404.pdf>

¹³⁸ Section 14 of the HYPPADEC Act 2010.

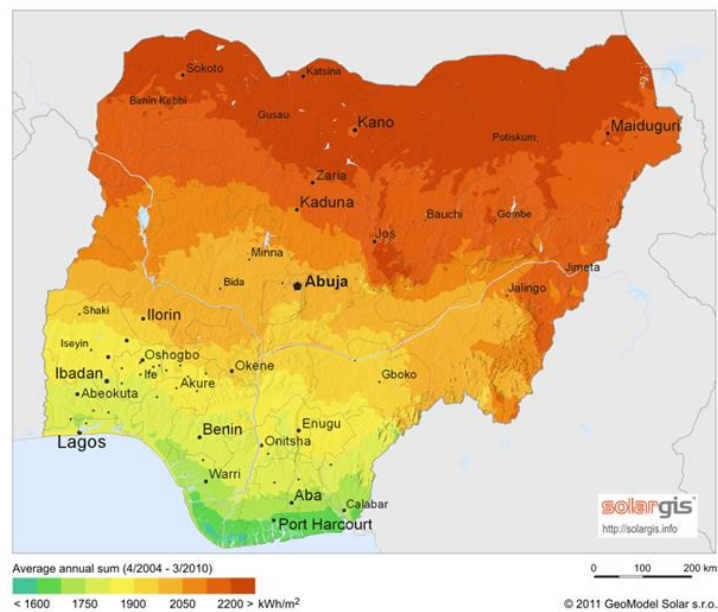
¹³⁹ Sambo, A.S. (2009) Strategic Developments in Renewable Energy in Nigeria. International Association for Energy Economics, 16.

Figure 34: Yearly Average Radiation in Nigeria (Wh/m2)



Source: Federal Ministry of Power¹⁴⁰

Figure 35: Horizontal Radiation in Nigeria



Source: SolarGIS¹⁴¹

The Energy Commission of Nigeria (ECN) has made some effort to harness the solar energy within Nigeria through the direct coordination of research and development activities undertaken by the Sokoto Energy Research Centre (SERC) and the National Centre for

¹⁴⁰ FMoP. Retrieved from

¹⁴¹ SolarGIS, Global Horizontal Radiation: Nigeria. Retrieved from http://solargis.info/doc/_pics/freemaps/1000px/ghi/SolarGIS-Solar-map-Nigeria-en.png

Energy Research and Development (NCERD).¹⁴² It has been reported that Nigeria has the potentials of generating 2,783,723,951MWh/year of solar-generated electricity,¹⁴³ which may be evacuated into the national grid, or used for power supply to locations not connected to the national grid, or for water pumping, rural electrification, and traffic lighting.

6.2.1.3. Wind Energy

Wind energy potential varies with wind speed and is available in Nigeria at annual average speeds of about 2.0 m² at the coastal region and 4.0 m² at the northern region of the country.¹⁴⁴ With this amount of wind energy potential, small scale wind turbine could be installed to boost electricity supply and also be integrated into the national grid.

Figure 36: Locations with Wind Energy potentials in Nigeria, by States



Source: New Era Energy¹⁴⁵

The technologies for harnessing this energy have, over the years been tried in the northern parts of the country, mainly for water pumping from open wells, and milling of grains. Despite Nigeria's exploitable wind energy resources, the present share of wind energy in the

¹⁴² ECN, Draft Renewable Energy masterPlan, November 2014. Retrieved from http://www.energy.gov.ng/index.php?option=com_docman&task=doc_download&gid=102&Itemid=49

¹⁴³ Open Energy Information. Retrieved from <http://en.openei.org/wiki/Nigeria>

¹⁴⁴ Sambo, A.S. (2009) Strategic Developments in Renewable Energy in Nigeria. International Association for Energy Economics, 16.

¹⁴⁵ New Era Energy, Nigeria Wind Energy. Retrieved from http://www.neenigeria.com/Nigeria_wind_NEW.png

national energy consumption has been low with no available commercial wind farms, but only small standalone wind power plants for pumping water in some northern states.

Nigeria's first wind farm, the Katsina Wind Farm, is presently under construction in Rimi Village, Katsina State.¹⁴⁶ The project, which will have a total output of 10.175MW, consists of 37 GEV MP with rated power of 275kW each, is being funded by Japan International Cooperation Agency (JICA) at a cost of 18,500,000 Euros.¹⁴⁷ It was first envisioned by the Katsina State government, and gained full support from the Federal Government in 2007. The need to diversify Nigeria's energy mix, boost electricity generation, and utilise the vast wind resources in the north of the country, were the main drivers for governmental support for this pioneer project in Nigeria.

6.2.1.4. Biomass Energy

Biomass is resources generated from plant material that can be degraded, i.e., can be converted. Biomass energy can be generated in Nigeria given the range of biomass and waste feedstock that are available for utilisation. A general categorization of sources comprises of energy crops (biomass fuels grown specifically for use as fuels, e.g., trees, grasses, and oil plants); forestry residues (wood fuels produced from lumbering and forestry such as wood chips, forestry trimmings, sawdust and bark); agricultural wastes (produced by farming practices for food production such as straw, bagasse and poultry litter); municipal waste (generated from household, industrial and commercial sources); and specialized industrial wastes (waste materials generated by industry, e.g., tyres, meat processing wastes and waste derived products).

6.2.1.5 Energy from Liquid Biofuels

Biofuels include alcohol fuels, such as ethanol, and "biodiesel," a fuel made from grain oils and animal fats. Biodiesel has potential for off grid power supply as well as peak load management at reduced emission consequence. Nigeria's biofuel programme is focused on

¹⁴⁶ Vergnet Group, Katsina Wind farm. Retrieved from <http://www.vergnet.com/pdf/fiches/en/nigeria-katsina.pdf>

¹⁴⁷ ECOWAS Observatory for Renewable Energy and Energy Efficiency, Katsina Wind Farm. Retrieved from <http://www.ecowrex.org/project/katsina-wind-farm-project>

producing ethanol from cassava and sugarcane. The use of biodiesel in diesel engines for power generation in remote locations is currently being promoted by relevant government agencies in line with the National Energy Policy. Jatropha and other oil seeds are currently being promoted for small power generation, while some communication firms have already initiated projects to power their repeater stations from biodiesel.

7. Regional and International Frameworks

7.1. Regional integration as universal principle

The 2015 International Energy Charter firmly supports its signatories enhancing regional cooperation in order to meet common energy challenges, acknowledging that enhanced energy trade is a powerful catalyst for strengthening regional cooperation for energy security. Members of the International Energy Charter agree to develop cooperation with regional organisations for sharing experience and specific examples from national practice in the area of sustainable development, access to modern energy services, energy poverty reduction, clean energy, energy efficiency, as well as the development and broader use of new clean technologies. Under the International Energy Charter, the freedom of movement of energy products, and the development of an efficient regional energy infrastructure, is essential to facilitate the development of stable and transparent trade in energy.

7.2. Nigeria regional leader and committed partner

7.2.1. Regional integration

The most important regional energy integration policy document is the ECOWAS Energy Protocol which establishes a legal framework to promote long-term co-operation in the energy field with a view to achieving increased investment in the energy sector, and increased energy trade in West Africa. It establishes, as a general principle, the use of energy to support development and economic growth, alleviate poverty and to improve the level and quality of life throughout the region. It also provides the use of energy to promote collective self-reliance and creating an atmosphere that provides for the private sector to participate fully in the development of energy in the region. It is important to note that the Protocol which was signed by ECOWAS Member State in Senegal in 2003 is modelled on the Energy Charter Treaty, thus agreeing to the International Energy Charter will not be a move in a different direction for ECOWAS Member States, which Nigeria is party to.

The combination of the wide availability of energy resources of the country, and the size of the regional market provides opportunities for greater attractiveness for projects and revenue generation, while improving the balance of payments. Thus Nigeria is involved in various projects with its neighbouring countries in West Africa, as well as North Africa.

7.2.2. Joint Development with Sao Tome and Principe

The Treaty between Nigeria and the Democratic Republic of Sao Tome and Principe on the Joint Development of Petroleum and other Resources, in respect of Areas of the Exclusive Economic Zone of the Two States is an agreement between the two countries creating a Joint Development Authority to explore and produce oil in the waters between Sao Tome and Principe and Nigeria. This was necessary because neither country can explore the 14billion barrels of oil estimated to be in the Joint Development Zone (JDZ) without interfering with the maritime territory of the other country.

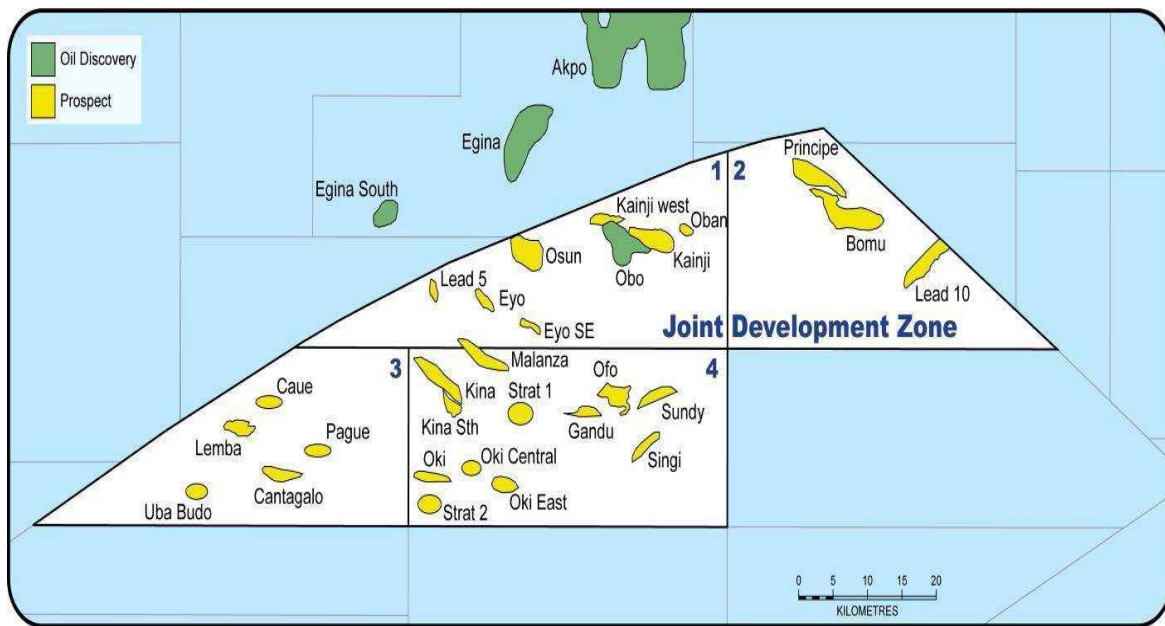
Figure 37: Map showing the Joint Development Zone



Source: ERHC Energy¹⁴⁸

¹⁴⁸ ERHC Energy. Retrieved from <http://erhc.com/map-of-gulf-of-guinea/>

Figure 37: Joint Development Zone Prospects



Source: EHRC Energy¹⁴⁹

7.2.3. West African Gas Pipeline (WAGP)

Under a Treaty signed by the Heads of States of the four countries, the West African Gas Pipeline Authority (WAGPA) was created as a single regional entity with regulatory authority over the constructions and operations of WAGP.¹⁵⁰ The Treaty is supported by domestic legislations in all the member states, with Nigeria enacting the West African Gas Pipeline Project Act 2005.¹⁵¹

A small amount of the natural gas produced in Nigeria is exported to nearby West African countries via the West African Gas Pipeline (WAGP), which began commercial operations in 2011. The WAGP is owned and operated by the West African Gas Pipeline Company Limited (WAPCo), a joint venture between public and private sector companies from Nigeria, Benin, Togo and Ghana. The owners are Chevron West African Gas Pipeline Limited (36.9%), NNPC (24.9%), Shell Overseas Holdings Limited (17.9%), Takoradi Power Company Limited (16.3%), Societe Togolaise de Gaz (2%), and Societe BenGaz S.A. (2%).

¹⁴⁹ ERHC Energy. Retrieved from <http://erhc.com/joint-development-zone-prospects/>

¹⁵⁰ WAGP website. Retrieved from <http://wagpa.org/wagpa.html>

¹⁵¹ WAGP. Retrieved from http://www.wagpa.org/Nigeria_WAGP_Act.pdf

The company has its headquarters in Accra, Ghana, with an office in Badagry, Nigeria, and field offices in Cotonou - Benin, Lome - Togo, Tema and Takoradi, both in Ghana.

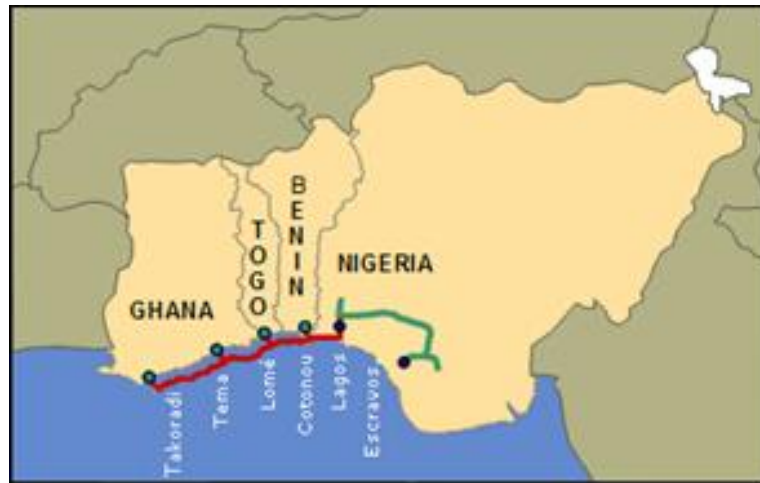
The company's main mandate is to transport natural gas from Nigeria to customers in Benin, Togo and Ghana in a safe, responsible and reliable manner, at prices competitive with other fuel alternatives.¹⁵² As a source of lower-cost sustainable fuel for power generation and direct use for industrial and commercial customers, the pipeline fosters an enabling environment for economic development and job creation in the sub-region, promotes economic integration among the countries, helps to achieve the goal of long-term energy security in the region, replaces liquid fuels in electricity generation, and contributes to the emission of greenhouse gas in the region. The WAPCo Pipeline serves as a pioneering model of a multi-country private/public sector partnership for sub-regional economic growth, and is evidence that through creative cooperation among States in the region in providing a predictable and stable business environment, significant private direct investment can be attracted. The Pipeline will provide a long-term supply of energy that will help stimulate private investment into the sub-region and the countries which will create jobs and wealth. Reduced cost of electricity for consumers since main source of generation will be natural gas, which is also the cleanest of all fossil fuels. The pipeline's extension to other sub-regional markets appear likely in future. This will bring additional economic benefits that are yet to be estimated.¹⁵³

Presently, the pipeline is 678km, and links into the existing Escravos-Lagos pipeline at the Itoki Natural Gas Export Terminal owned by the Nigerian Gas Company, and then proceeds to a beachhead in Lagos. From there it moves offshore to Takoradi, in Ghana, with gas delivery laterals extending to Cotonou (Benin), Lome (Togo) and Tema (Ghana). The Escravos-Lagos pipeline system has a capacity of 800 MMscfd, and the WAPCo system will have the nameplate capacity to export 170MMscfd and peak over time at a capacity of 460MMscfd. The main offshore pipeline runs East to West at an average water depth of 35 metres though Ghana, Lome, and the Benin – Nigerian frontier ranges between 50 to 70 meters, with its range from the coast as varied as the depth. The main pipeline is 20 inches in diameter. Cotonou and Lome laterals are 8 inches respectively while the Tema lateral is 18 inches.

¹⁵² WAGP, Company Profile. Retrieved from http://www.wagpco.com/index.php?option=com_content&view=article&id=46&Itemid=78&lang=en.

¹⁵³ WAGP, Benefits of the Pipeline. Retrieved from http://www.wagpco.com/index.php?option=com_content&view=article&id=114&Itemid=105&lang=en.

Figure 38: The West African Gas Pipeline



Source: West African Gas Pipeline¹⁵⁴

WAGP transports purified natural gas free of heavy hydrocarbons, liquids and water, ideally suited as fuel for power plants and industrial applications. Eighty-five per cent of the gas is for power generation and the remaining for industrial use. The Volta River Authority's Takoradi Thermal Power Plant in Ghana, CEB of Benin and Togo are WAPCo's foundation customers. Exports via the pipeline fell from 29 Bcf in 2011 to 14 Bcf in 2012 after the pipeline was shut down for repairs from August 2012 to July 2013, and then it rose again to 21 Bcf in 2013.¹⁵⁵

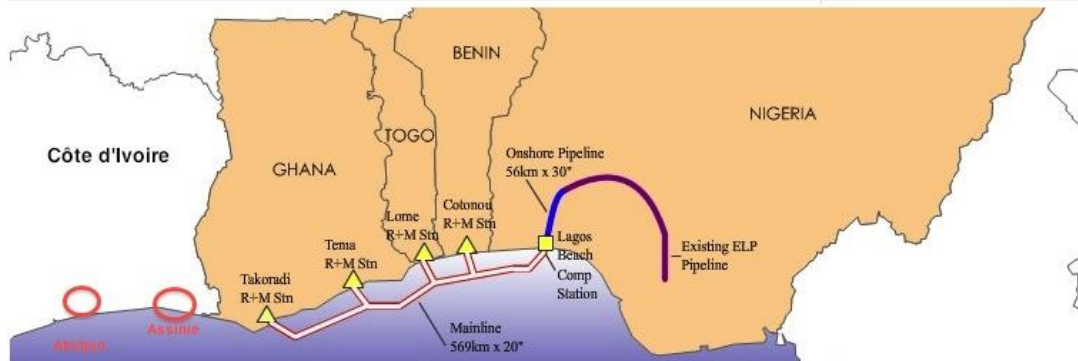
The Treaty establishing the project provides for possible extension to other countries. Thus, several States within the West African Sub region have expressed the wish to extend the West African gas pipeline network to Dakar via Abidjan, Monrovia, Freetown, Conakry, Bissau and Banjul. Ivory Coast has even applied to become a state signatory of the protocol governing the WAGP. The ambition of the Ivorian authorities would be to extend the pipeline to the coastal town of Assini, in south-eastern Côte d'Ivoire. WAGP can be connected to a pipeline project awarded to Saipem, which is planned to link Assini to Abidjan. The pipeline project worth 32 billion CFA francs (50 million euros) is expected to transport gas from

¹⁵⁴ WAGP, About the Pipeline. Retrieved from http://www.wagpco.com/index.php?option=com_content&view=article&id=122&Itemid=84&lang=en

¹⁵⁵ Cedigaz, Statistical Database, 2013. Retrieved from <http://www.cedigaz.org/products/natural-gas-database.aspx>.

Ivorian oil blocks operated by Vanco and CNR to Abidjan for use by power plants. The junction with the WAGP would also help carry gas from Nigeria to Abidjan.¹⁵⁶

Figure 39: Proposed extension of the WAGP by the Government of Ivory Coast



Source: Juene Afrique¹⁵⁷

7.2.4. The Proposed Trans-Saharan Gas Pipeline (NIGAL Project)

Nigeria and Algeria have proposed plans to construct the Trans-Saharan Gas Pipeline (TSGP), also known as the NIGAL Project. The pipeline would carry natural gas from Nigeria to Algeria for onward delivery to the European market.¹⁵⁸ The project estimated to cost about \$12 billion is one of the three major projects of the New African Partnership Development (NEPAD), with the Lagos-Algiers highway, and the fiber optic along the gas pipeline.¹⁵⁹ In 2009, NNPC signed an MoU with Sonatrach, the Algerian national oil company, to proceed with the project. The pipeline which will be 4,300km or 4,180km in length, if it terminates at El Kala or Beni Saf, will run through Nigeria (1050km), Niger (750km), and Algeria (2500km). The pipeline system will be 48 or 56 inches in diameter, and will be capable of supplying the European market with 20 to 30 billion m³ of natural gas per year. Within the European Union, gas consumption is shrinking but gas production is declining even faster (30% of the gas needs are supplied by Russia, compared to 14% provided by Algeria). Large

¹⁵⁶ Juene Afrique, November 4, 2013. Retrieved from <http://economie.jeuneafrique.com/regions/afrique-subsaharienne/20450-cote-divoire--la-production-de-gaz-naturel-a-double-en-un-an.html>.

¹⁵⁷ Juene Afrique, November 4, 2013. Retrieved from <http://economie.jeuneafrique.com/regions/afrique-subsaharienne/20450-cote-divoire--la-production-de-gaz-naturel-a-double-en-un-an.html>

¹⁵⁸ NNPC, Investment Opportunities, Nigerian Gas. Retrieved from <http://www.nnpcgroup.com/NNPCBusiness/BusinessInformation/InvestmentOpportunities/NigeriaGas.aspx>

¹⁵⁹ NNPC, News and Updates. Retrieved from <http://www.nnpcgroup.com/PublicRelations/NNPCinthenews/tabid/92/articleType/ArticleView/articleId/172/TRANS-SAHARA-GAS-PIPELINE-PROJECT-viable--GMD.aspx>

natural gas consumers like Germany, France, the United Kingdom and Spain now prefer to purchase liquefied natural gas that can be exported by ship.

Figure 40: The Proposed Trans-Saharan Gas Pipeline



Source: Financial Times¹⁶⁰

The benefits of the project to the region include providing transportation infrastructure to help reduce gas flaring in Nigeria, help preserve the environment by eliminating gas flaring, developing the regions through which the pipeline will pass, creating jobs for locals during the construction and operation of the pipeline, synergy with other proposed projects under NEPAD, increase regional cooperation, cause export diversification of Nigerian gas versus the more expensive LNG, and diversification and increased security of access and supply of natural gas to Europe.¹⁶¹

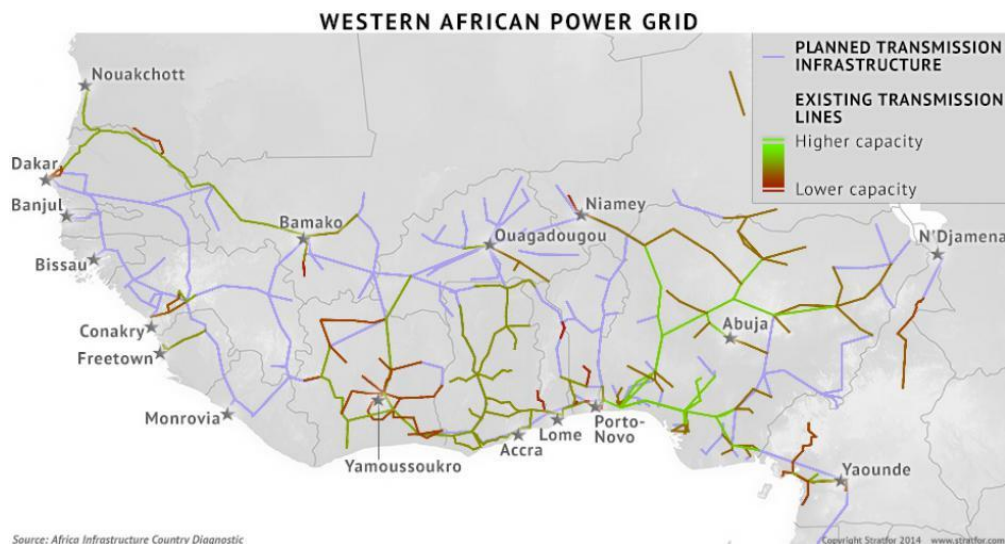
7.2.5. The West African Power Pool

¹⁶⁰ Financial Times, Europe Plays catch-up in race for gas by Matthew Breen and William Wallis September 17, 2008. Retrieved from <http://www.ft.com/cms/s/0/630c6f4e-841f-11dd-bf00-000077b07658.html#axzz3UwYHhk3G>

¹⁶¹ Ministère de L'énergie Algérie, Project NIGAL. Retrieved at http://www.mem-algeria.org/francais/index.php?page=presentation_nigal

The West African Power Pool (WAPP) is a specialized institution established by Decision A/DEC.5/12/99 of the 22nd Summit of the Authority of ECOWAS Heads of State and Government. It covers 14 of the 15 countries of the regional economic community (Benin, Côte d'Ivoire, Burkina Faso, Ghana, Gambia, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo). Its aim is to integrate the operations of the power systems of the states into a unified regional electricity market, and assure the citizens of ECOWAS Member States stable and reliable electricity supply. WAPP is made up of 26 member companies, both public and private utility companies in West Africa, and is also expected to ensure the promotion and development of power generation and transmission facilities, as well as the coordination of power trade between the States.

Figure 41: The West African Power Grid (Existing and Proposed Lines)



Source: Stratfor Global Intelligence¹⁶²

¹⁶² Stratfor Global Intelligence. Powering Africa's Economies: Prospects for Growth in Electricity Markets. Retrieved from <https://www.stratfor.com/analysis/powering-africas-economies-prospects-growth-electricity-markets>

7.3. International cooperation as universal principle

*Having regard to the principles of the UN Charter and to the outcome documents of various energy-related regional and international conferences, the **2015 International Energy Charter** signatories are aware of the obligations under major relevant multilateral agreements, of the wide range of international energy cooperation and of the extensive activities by existing international organisations in the energy field. Its signatories agree to enhance development of trade in energy consistent with major relevant multilateral agreements, such as the WTO Agreement and its related instruments, and to also ensure that the international rules on the promotion and protection of industrial, commercial and intellectual property rights are assigned. The International Energy Charter also affirms the importance of full access to adequate dispute settlement mechanisms, including national mechanisms and international arbitration in accordance with national laws and regulations and all relevant bilateral and multilateral treaties and international agreements.*

7.4 Nigerian international commitments

7.4.1. Investment Agreements & Related Instruments

Nigeria is a signatory to various Bilateral International Treaties (BITs), Multilateral International Treaties (MITs), and Related instruments to facilitate cross-border trade, investment promotion and investment protection.

The Bilateral Investment Treaties on trade and investments with Finland (20 March 2007), France (19 August 1991), Germany (20 September 2007), Italy (22 August 2005), Republic of Korea (1 February 1999), the Netherlands (1 February 1994), Romania (3 June 2005), Serbia (7 February 2003), Spain (19 January 2006), Sweden (1 December 2006), Switzerland (1 April 2003), Taiwan (7 April 1994), and the United Kingdom (11 December 1990) are in force. Those signed with Algeria, Bulgaria, China, Egypt, Ethiopia, Jamaica, Russia, Turkey, and Uganda have been signed and awaiting ratification.¹⁶³ Some BITs contain no specific provision on energy, but they do cover general provisions on trade and investment.

Nigeria has also signed other Investment Agreements, including ECOWAS – USA TIFA (signed 05 August, 2014), ECOWAS Energy Protocol (signed 31 January, 2003), Cotonou Agreement with the EU (01 April, 2003), Nigeria – USA TIFA (16 February, 2000), AU Treaty (12 May, 1989), ECOWAS Protocol of Community Enterprises (12 May 1989),

¹⁶³ UNCTAD. Retrieved from <http://investmentpolicyhub.unctad.org/IIA/CountryBits/153>

Organization of Islamic Conference (OIC) Investment Agreement (23 September 1986), and ECOWAS Protocol on Movement of Persons and Establishment (08 April 1980), and ECOWAS Treaty (20 June, 1975).¹⁶⁴

Furthermore, Nigeria is part of various multilateral Investment Related Instruments (IRI). The Intergovernmental Agreements include the OPEC Fund Model Agreement (2001), WTO Fourth and Fifth Protocols to GATS (1997), WTO Trade-Related Aspects of Intellectual Property Rights (1994), WTO Trade-Related Investment measures (1994), WTO General Arrangements on Trade and Services (1994), OIC Islamic Corporation for the Insurance of Investment Credit (1992), Multilateral Investment Guarantee Agency Convention (1985), International Centre for Settlement of Investment Disputes Convention (1965), UN New York Convention (1958), and UN Code of Conduct on Transnational Corporations (1983).¹⁶⁵ The Guidelines, Principles, and Resolutions are the UN Guiding Principles on Business and Human Rights (2011), ILO Tripartite Declaration on Multinational Enterprises (1977, 2000 and 2006), WTO Doha Declaration (2001), WTO Singapore Ministerial Declaration (1996), World Bank Investment Guidelines (1992), New International Economic Order UN Resolution (1974), UN Charter of Economic Rights and Duties of States (1974), and Permanent Sovereignty UN Resolution (1962).¹⁶⁶

Nigeria has been a member of the World Trade Organization (WTO) since 1 January 1995 and a member of GATT since 18 November 1960, and has ratified all Principles and Rules under the organization. Since the general principles that guide the International Energy Charter are based on the rules of WTO, this aspect becomes important to put the country in a strategic position to join the International Energy Charter.

7.4.2. International Initiatives for Investments in the Power Sector

7.4.2.1. Power Africa

¹⁶⁴ UNCTAD. Retrieved from <http://investmentpolicyhub.unctad.org/IIA/CountryOtherIias/153#iialInnerMenu>

¹⁶⁵ UNCTAD. Retrieved from <http://investmentpolicyhub.unctad.org/IIA/CountryIris/153#iialInnerMenu>

¹⁶⁶ UNCTAD. Retrieved from <http://investmentpolicyhub.unctad.org/IIA/CountryIris/153#iialInnerMenu>

On June 30, 2013, President Barack Obama announced Power Africa — a five-year initiative to increase the number of people with access to power in sub-Saharan Africa by adding more than 30GW of generation capacity, and making electricity accessible to 60 million new homes and businesses.¹⁶⁷ It began in six focus countries with ambitious strategies for energy sector development – Nigeria, Ethiopia, Kenya, Tanzania, Liberia, and Ghana. Additionally, in Uganda and Mozambique, Power Africa promotes responsible and transparent resource management.

This initiative by the US government is intended to mobilize affordable and long term financing for expansion of networks or increase in generation capacities, as well as to help promote U.S. technological solutions. The Power Africa agencies have also provided support for trade missions and engaged in outreach efforts for American companies interested in investment opportunities in Nigeria, provide political risk insurance for project loans, and engage in risk mitigation efforts in coordination with the Nigerian Government. Their partners in Nigeria include Heirs Holding, UBA Capital, General Electric, Africa Finance Corporation, Africa Development Bank, Standard Chartered Bank, Symbion, Africa Infrastructure Investment Managers, Nigeria Solar Capital Partners, America Capital Energy and Infrastructure, and the World Bank.¹⁶⁸

Through the Initiative, the USAID has participated in the evaluation of technical bids, review of industry agreements signed by the investors during the privatization of the PHCN successor companies, provision of credit enhancement facility to commercial banks for short-term capital expenditure, provision of credit enhancement to unlock long-term capital through pension and insurance for the successor distribution companies, and assistance during trade missions for equipment sourcing. Also, the initiative has assisted NBET, the bulk trader of electricity in Nigeria, through the provision of technical support during negotiations of Power Purchase Agreement (PPAs) and Put Call Options Agreement (PCOA), and in the drafting of the PPA for a wind project.¹⁶⁹

¹⁶⁷ USAID. Retrieved from <http://www.usaid.gov/powerafrica/about-power-africa>

¹⁶⁸ USAID. Retrieved from <http://www.usaid.gov/powerafrica/partners/private-sector>

¹⁶⁹ USAID. Retrieved from <http://www.usaid.gov/powerafrica/partners/african-governments/nigeria>

7.4.2.2. African Development Fund (ADF) Partial Risk Guarantee (PRG) Program

In December of 2013, the Board of the African Development Bank Group (AfDB) approved an African Development Fund (ADF) Partial Risk Guarantee (PRG)¹⁷⁰ program of US \$184.2 million which will help increase Nigeria's electricity generation by catalysing private sector investment and commercial financing in the power sector. The PRG will mitigate the risk of the Nigeria Bulk Electricity Trading Plc (NBET) not fulfilling its contractual obligations under its PPAs with eligible IPPs. This is expected to increase the comfort level of private sector financiers and commercial lenders investing in the Nigerian power sector, and over the long term, lead to increased productivity, economic activity and growth, and reduced poverty. The PRG is a political risk mitigation instrument that covers private lenders and investors against the risk of the government or government-owned entity failing to meet its contractual obligations to a project. To date, NBET has nominated four competitively awarded IPPs to be supported under the proposed Program, namely two Greenfield gas fired IPPs (Century Power at Okija - 495 MW and Ikot Abasi - 250 MW), and two recently privatized brownfield IPPs (Transcorp Ughelli power plant - 972MW, and Shiroro Hydroelectric station - 600MW).¹⁷¹

Furthermore, the African Development Bank (AfDB) recently announced its commitment of a \$200 million Partial Risk Guarantee (PRG) to support coal-to-power investments to help in Nigeria's attempt to diversify her sources of electricity generation with the addition of various coal-to-power projects.¹⁷²

7.4.2.3. IBRD Partial Risk Guarantees Project by World Bank

¹⁷⁰ African Development Bank. Retrieved from http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Nigeria_-_Power_Sector_Privatization_Program_-_Appraisal_Report.pdf

¹⁷¹ AFDB. Retrieved from <http://www.afdb.org/en/news-and-events/article/adf-partial-risk-guarantee-program-to-stimulate-private-investment-in-the-nigerian-power-sector-12708/>

¹⁷² Thisday Newspaper. Retrieved from <http://www.thisdaylive.com/articles/afdb-provides-200m-guarantee-for-nigeria-s-coal-to-power-projects/204604/>

The World Bank in 2009,¹⁷³ approved International Development Association credit worth USD1.02 billion for four major projects in Nigeria, including USD600 million for power and gas projects. Of the USD600 million, USD200 million was for improving electricity supply through network investments and technical assistance and the remaining USD400 million will be extended through partial risk guarantees (PRGs) in support of domestic gas market development.¹⁷⁴ The Nigeria Electricity and Gas Improvement Project (NEGIP) is one of the beneficiaries of the credit and is expected to provide PRGs in support of Gas Supply Agreements to boost gas supply for power projects in the country. The project will also rehabilitate existing power transmission and distribution infrastructure to facilitate supply of power from power stations to consumers. The project aims to improve the quality of gas supply by instilling commercial discipline in the gas sector through commercial contracts, to reduce power losses from the electrical grid and to improve power quality and reliability.

Recently, the World Bank Group, on May 1, 2014, approved partial risk guarantees to help power sector operators in the country to borrow up to \$1.19bn to execute various projects. The Board of Executive Directors of the three arms of the World Bank (World Bank, International Finance Corporation and Multilateral Investment Guarantee Agency) approved the package of loans and guarantees supporting a series of energy projects that would boost independent power generation and ease crippling energy shortages in Nigeria. The approved partial risk guarantees include up to \$245m for the 459-megawatt Azura-Edo Power Plant near Benin City, Edo State; and up to \$150m for the 533-MW Qua Iboe plant in Ibeno, Akwa Ibom State.¹⁷⁵ The boards of the IFC and MIGA approved loans and hedging instruments of up to \$135m and guarantees of up to \$659m for the Azura-Edo project.¹⁷⁶

7.4.3. International Assistance for the Reform Programme

¹⁷³ World Bank. Retrieved from <http://www.worldbank.org/projects/P120207/nigeria-power-sector-guarantees-project?lang=en>

¹⁷⁴ World bank. Retrieved from <http://www.worldbank.org/projects/P106172/nigeria-electricity-gas-improvement-project-negip?lang=en>

¹⁷⁵ World Bank. Retrieved from http://www-wds.worldbank.org/external/default/WDSPContentServer/WDSP/IB/2014/05/06/000333037_20140506111203/Rendered/PDF/878780BSOP1202000Box385206B00OUO090.pdf

¹⁷⁶ World Bank. Retrieved from <http://www.worldbank.org/en/news/press-release/2014/05/06/world-bank-group-project-series-local-power-output-nigeria>

As the ongoing reform of the power sector progresses, several international financial institutions, countries, regional institutions, and donor agencies have been actively involved, including:

- (i) **United Nations (UN) - The UN** is involved in small scale renewable energy (solar home systems and clean cookstoves) and energy efficiency projects through its various agencies like UNICEF, UNIDO, and UNDP. UNIDO is strongly involved in small hydropower development with the establishment of the Regional Centre for Small Hydro Power¹⁷⁷ and the support to the development of several small hydropower projects.
- (ii) **International financial institutions** – The WB, IBRD, IFC, and the AfDB are actively involved in the ongoing reform as discussed earlier, as well as providing support for the construction of new infrastructure. In addition, the IFC recently launched Lighting Africa in Nigeria¹⁷⁸ to help Nigerians gain access to modern, clean and affordable lighting products by 2017.
- (iii) **European Community** - The EU-backed Energising Access to Sustainable Energy (EASE),¹⁷⁹ supports renewable energy, energy efficiency and rural electrification through the Nigerian Energy Support Programme (NESP), which is also funded by Germany and implemented by GIZ.¹⁸⁰ The UK, through its Department for International Development,¹⁸¹ established the Nigerian Infrastructure Advisory Facility (NIAF)¹⁸² and Solar Nigeria being implemented by Adam Smith International.¹⁸³ France is involved in the sector through the *Agence Française de Développement* (AFD) and PROPARCO¹⁸⁴ that work on access to finance for renewable energies, training for the power sector staff, and provide support to TCN.

¹⁷⁷ UNIDO. Retrieved from <http://www.unido.org/en/what-we-do/environment/energy-access-for-productive-uses/renewable-energy/focus-areas/small-hydro-power.html>

¹⁷⁸ IFC. Retrieved from <http://ifcext.ifc.org/IFCExt/pressroom/IFCPressRoom.nsf/0/D3C00B7394A8D59E85257E0400319C58?OpenDocument>

¹⁷⁹ European Commission. Retrieved from http://ec.europa.eu/europeaid/documents/aap/2013/af_aap_2013_nga.pdf

¹⁸⁰ GIZ. Retrieved from <http://www.giz.de/en/worldwide/26374.html>

¹⁸¹ DFID. Retrieved from <http://devtracker.dfid.gov.uk/countries/NG/projects/>

¹⁸² NIAF. Retrieved from <http://niafng.org/sectors-2/power/>

¹⁸³ Adam Smith International. Retrieved from <http://www.adamsmithinternational.com/explore-our-work/west-africa/nigeria>

¹⁸⁴ AFD. Retrieved from <http://www.afd.fr/lang/en/home/pays/afrique/geo-afr/nigeria/nigeria-projets>

Also, Sweden and Norway, even though not members of the European Economic and Monetary Union have also been active in the power sector reform.

- (iv) **United States of America** – The US through the USAID currently has several projects in Nigeria covering various aspects such as renewable energy, and conventional energy sources through for example the Power Africa Initiative¹⁸⁵ and the Nigeria Energy and Climate Change (NECC). They also cover finance for the private sector and skills development through the Renewable Energy And Energy Efficiency Project (REEEP)¹⁸⁶ implemented by Winrock International.
- (v) **Japanese International Cooperation Agency (JICA)** – The Agency has played an important role in the development of solar energy and hydrological master plans, including the identification of possible hydropower sites. It has also supported the development of renewable energy infrastructure in the country.¹⁸⁷

¹⁸⁵ USAID. Retrieved from <http://www.usaid.gov/powerafrica/partners/african-governments/nigeria>

¹⁸⁶ REEEP. Retrieved from <http://www.reeep.org/projects/development-international-energy-management-standards-integration-iso-9000>

¹⁸⁷ JICA. Retrieved from <http://www.jica.go.jp/nigeria/english/activities/activity01.html>

8. Investment protection

8.1 Investment protection as universal principle

*In recognising the importance of energy security for energy producing, transit and consuming countries (regardless of their state of development), the **2015 International Energy Charter** encourages cooperation to promote closer and mutually beneficial commercial relations and investments in the energy sector. Signatories agree to create a climate favourable to the operation of enterprises and to the flow of investments and technologies. In order to promote the flow of investment, signatories agree to make every effort to remove all barriers to investment in the energy sector and provide, at national level, for a stable and transparent legal framework for foreign investment in accordance with relevant international laws and rules on investment and trade.*

8.2 Nigerian experience and commitment on investment protection

Nigeria encourages the private sector participation and this has been increasingly remarkable over the last ten years due to the government commitment to increase private sector participation in the energy sector. With consistent and strong growth in GDP witnessed over the past decade, Nigeria has attracted considerable interest from investors from different parts of the world. The government actively seeks foreign investment and was the largest recipient in 2012, with over \$7 billion in Foreign Direct Investment (FDI). Promotion of investments in Nigeria is the responsibility of the Nigerian Investment Promotion Commission (NIPC).¹⁸⁸

Various opportunities exist for investments in Nigeria. These opportunities are also supported by government policies that do not hinder repatriation of funds, protection of investment against expropriation and nationalization, high returns on investment, abundant and growing untapped resources, deregulation in almost all the sectors (the reform of the oil and gas sector is expected to be completed next year), the deregulated sectors promote private sector participations, and competitive incentives.

Nigeria has the following investment climate features that make it appealing to investors:

1. Abundant Resources: Nigeria has enormous mineral, agricultural and human resources which are yet to be fully exploited.

¹⁸⁸ International Center for Nigerian Law. Retrieved from <http://www.nigeria-law.org/Nigerian%20Investment%20Promotion%20Commission%20Act.htm>

2. Market Size: Nigeria offers a market of about 180 million people, and potentially stretches into the growing West African sub-region.
3. Political Stability: There exist a stable political environment as the country has been under democratic rule since May 1999.
4. Free Market Economy: A favourable climate for businesses has been created, administrative and bureaucratic procedures streamlined, and various reform programs being implemented.
5. Robust Private Sector: The country has a dynamic private sector, which has assumed greater responsibilities under the new economic environment.
6. Free Flow of Investment: Exchange control regulations have been liberalised to ensure free flow of international finance, ensuring unrestricted movement of investment capital.
7. Attractive Incentives: A comprehensive package of incentives has been put in place to attract investment from the private sector, both domestic and international.
8. Fast Growing Financial Sector: There is a well-developed banking and financial sector, and the investor has access to working capital and other credit facilities.
9. Skilled and Low Cost Labour: There is an abundance of skilled labour at an economic cost, resulting in production costs which are among the lowest in Africa.
10. Infrastructure: Rapid development of physical and industrial infrastructure, in terms of transportation, communications, electricity and water supply.¹⁸⁹

8.3. Incentives for Investors in Nigeria

The Nigerian Government has put in place a number of investment incentives to stimulate private sector investment in the country, especially direct foreign investments. Some incentives cover all sectors, while others are limited to some specific sectors or location of the industry. Below is a list of available incentives for investors in Nigeria.¹⁹⁰

A. General Incentives for all Sectors – Such incentives available to investors in all sectors include the following:

- (i) The Companies Income Tax Act Cap C21 L.F.N. 1990¹⁹¹ has been amended in order to encourage potential and existing investors and entrepreneurs.

¹⁸⁹ "Why invest in Nigeria" by NIPC. Retrieved from http://nipc.gov.ng/?page_id=33

¹⁹⁰ "Investment Incentives" by NIPC. Retrieved from http://nipc.gov.ng/?page_id=56

¹⁹¹ Federal Inland Revenue Services. Retrieved from <http://www.firs.gov.ng/Tax-Management/Tax%20Legislations/CITA.pdf>

- (ii) Pioneer Status is granted to certain industries to enable them make a reasonable level of profit within its formative years, and the profit is be ploughed back into the business.
- (iii) Tax Relief is granted to industries that spend on R&D for the improvement of their processes and products.
- (iv) Capital Allowances is enjoyed by companies, depending on whether it is a qualifying expenditure.
- (v) Incentives are in place for industries that set up in – plant training facilities.
- (vi) Industries that invest in infrastructure, i.e., provide facilities that ordinarily should have been provided by government, can get tax deductions.
- (vii) Pioneer industries sited in economically disadvantaged Local Government Area are entitled to tax holiday and an additional capital depreciation allowance.
- (viii) Industries with high labour/capital ratio are entitled to tax concessions.
- (ix) Tax concession is granted for industries that use finished imported products as inputs for local fabrication.
- (x) Re-investment allowance is granted for qualifying capital expenditure used for approved expansion of capacity, modernization of facilities, and diversification into related products.
- (xi) Tax credit is granted to industries that attain the minimum level of local raw material sourcing and utilisation.

B. Incentives for Specific Sectors - There are specific incentives for companies involved in various sectors, including Solid minerals, Petroleum, Gas, and Electricity Sectors.

C. Incentives for Exportation - Export incentives exist to encourage and assist exporters to increase and diversify the total value and volume of non-oil exports from Nigeria.

D. Establishment of Oil & Gas Free Zones - The Oil and Gas Export Free Zone Act No. 8 of 1996¹⁹² established an Authority to manage, control and co-ordinate all the activities within the three oil and gas service centres around the ports of Onne (near PH), Calabar and Warri. These zones also have approved several incentives and fiscal measures to attract investments to the zones.

E. Establishment of Export Processing Zones - The enacted of the Nigeria Export Processing Zones Act No 63 of 1992¹⁹³ has led to the establishment of about 25 Free Trade

¹⁹² LawNigeria.com. Retrieved from <http://lawnigeria.com/LawsoftheFederation/OIL-AND-GAS-EXPORT-FREE-ZONE-ACT.html>

¹⁹³ Nigeria Export Processing Zones Authority. Retrieved from <http://www.nepza.gov.ng/downloads/NEPZA631992.pdf>

Zones supervised by the NEPZ Authority, with approved incentives and fiscal measures which encourage investments in the zones.

F. Incentives for Special Investments - For the purpose of promoting identified strategic or major investment, the Commission can negotiate specific incentive packages for the promotion of special investments.

G. Double Taxation Agreements with other Countries - In the last few years, double taxation agreements have been entered into by Nigeria with a number of countries. These agreements afford relief from double taxation in relation to taxes imposed on profit taxable in Nigeria, and any taxes of similar character imposed by the law of the other country. Nigeria has DTAs with UK, France, Netherlands, Belgium, Pakistan, Canada, Czech Republic, Philippines, and Romania. Negotiations are ongoing with Turkey, Russia, India, and Korea.

H. Investment Promotion and Protection Agreements - As part of additional effort to foster foreign investors' confidence in the Nigeria economy, Government continues to enter into bilateral IPPAs with countries that do business with Nigeria. These agreements help to guarantee the safety of the investment of the contracting parties in the event of war, revolution, expropriation or nationalization, and guarantees investors the transfer of interests, dividends, profits and other incomes as well as compensation for dispossession or loss. Nigeria has signed IPPAs with France, United Kingdom, Netherlands, Romania, Switzerland, Spain, and South Africa. Negotiations with USA, Belgium, Sweden and Russian are ongoing.

I. Liberalisation of Ownership Structure - The government in repealing the Nigerian Enterprises Promotion Act of 1972, and promulgating the NIPC Act has liberalised the ownerships structure of business in Nigeria thereby allowing foreigners to own 100% shares in any company.

J. Repatriation of Profit - Under the provisions of the Foreign Exchange (Monitoring & Miscellaneous Provision) Act No. 17 of 1995 (now Cap F34 LFN 2004),¹⁹⁴ foreign investors are free to repatriate profits and dividends net of taxes through an authorized dealer.

K. Guarantees Against Expropriation - The NIPC Act guarantees that no enterprise shall be nationalized or expropriated by any government in Nigeria.

¹⁹⁴ International Center for Nigerian Law. Retrieved from <http://www.nigeria-law.org/Foreign%20Exchange%20%28Monitoring%20and%20Miscellaneous%20Provisions%29%20Act.htm>

9. Added Value of Acceding to the International Energy Charter and Energy Charter Treaty

9.1. At political level

9.1.1. Political signal of the country to international community

By signing the International Energy Charter, a country sends a political signal to the international community that it shares a number of international energy principles on trade, investment, transit and energy efficiency in such an important sector as the energy sector. Since investment protection is the cornerstone of the Energy Charter, it would be a good chance for governments to send a message to the investor community of their endorsement of transparency and good governance. This would most of all benefit countries in unstable political situations and the ones, which seek to enhance their ties with some key countries from the Energy Charter constituency.

9.1.2 Effects of modernization of the Energy Charter Process

The world's energy interdependence has dramatically intensified over the last decade. Improved energy security with multiple economic, technological and environmental benefits could be derived from international cooperation in the energy sector. At the same time potential interruptions to the global energy supplies due to conflicts, volatile energy prices, lack of investments and other challenges have resulted in a more fragile global energy architecture. Such challenges require both national and international responses. Where the problems cannot be adequately addressed by a country acting alone, acting cooperatively at the international level becomes essential for a country to protect its own interests.

The International Energy Charter is going to play a major role in establishing common principles to promote long-term cooperation in the energy sector based on mutual benefits. The institutional benefits of signing the International Energy Charter include, but not limited to, the following:

- The International Energy Charter is going to be a benchmark document to be signed by numerous countries worldwide.
- The International Energy Charter provides inspiration and motivation to pursue energy security for all including producers, transit and consumer countries, as well as universal energy access.

- Signing the International Energy Charter means to join an established international framework of long-term cooperation in the energy sector.
- The International Energy Charter is a policy but not a legally binding framework that allows a country to strengthen energy security, promote access to energy resources and new markets, facilitate access to finance, benefit from experience exchange and multilateral cooperation on sustainable development of the energy sector.

9.2. At strategic level

9.2.1. Promotion of energy investments and trade

A country, by signalling its willingness to engage seriously in a dynamic political process resulting from the International Energy Charter as well as its ability to agree on a strategic, forward-looking document, demonstrates that it considers the Energy Charter Process and its tools as instruments of choice. Thus, signature of the International Energy Charter would demonstrate to international investors that a country commits to the principles of secure investments. In this way, a country becomes a more attractive destination for international investments, while, at the same time, being able to use the International Energy Charter as a reference tool for its own energy investment and trade initiatives.

9.2.2. Engagement in multilateral cooperation and good governance

It is difficult for countries to find isolated solutions to the complex and interlinked energy challenges, which know no borders. International cooperation is imperative to find effective, lasting and mutually beneficial solutions. The Energy Charter has a broad membership, involving developed and developing, energy exporting, importing and transiting countries. Signing the International Energy Charter will allow the signatory's representatives to assemble under the Energy Charter Ministerial Conference and Working Groups, which could serve as a platform for building relationships, and sharing of information related to the challenges faced in the energy sector. The challenges concerning security of supply, competitiveness and climate action should be solved through a common approach, to which the International Energy Charter will play an important role. Signatories to the International

Energy Charter will acknowledge this common approach publicly, without any legal commitments.

9.2.3. Influential and confident position within the Energy Charter Process

Engagement to the International Energy Charter is an open and inclusive process. More than 80 countries from all over the world agreed on the text of the International Energy Charter. The text reflects today's global energy challenges and international policy objectives. The openness of the International Energy Charter to new countries enhances the confidence and ownership of those countries in the Energy Charter process.

9.3. At practical level

9.3.1 Observer status with the Energy Charter Conference

Signing the International Energy Charter automatically grants an observer status, which will make it possible for new countries to attend the meetings of the Energy Charter Conference, without a right to vote.¹⁹⁵ Furthermore, observer countries will have the possibility to attend official meetings of subsidiary bodies on political and expert level in the capacity of observers with a right to speak.

If the necessary funding is provided, observers may benefit from activities of the Energy Charter Secretariat like forums, executive training programmes, energy efficiency reviews or reports on investment climate and market structure. Observers may be invited to send seconded experts and trainees to the Secretariat in Brussels in view of deepening their engagement in the process of applying the principles of the International Energy Charter and consider the adoption of the Energy Charter Treaty.

9.3.2. Getting familiar with the Energy Charter Treaty

¹⁹⁵ Observer status is not defined in the Energy Charter Treaty. For this purpose, a Working Group on Procedural Issues was established at the 24th Meeting of the Energy Charter Conference in Astana.

The Energy Charter Treaty is unique in so far as it provides a legally binding framework for energy cooperation for a large and diverse membership.¹⁹⁶ However, it is apparent that accession by new countries to the Treaty is not something that can be achieved over night. For new members sharing the principles of the International Energy Charter, it is imperative to thoroughly analyse the provisions of the Energy Charter Treaty before committing to further steps. Signing the International Energy Charter can only be a beginning that does not pre-empt in any way the decision of a state to accede to the Energy Charter Treaty. As observers to the Energy Charter Conference, non-members will however have the opportunity to learn more about the Treaty, its benefits and obligations, and will cooperate closely with the members to that end. This will enable them to make an informed decision about possible further steps.¹⁹⁷

9.3.3. Possibility to initiate the Early Warning Mechanism

Countries signing the International Energy Charter are automatically granted a right to initiate the Early Warning Mechanism (EWM). Its aim is to provide a non-binding framework for preventing and overcoming emergency situations in the energy sector related to the transit and supply of electricity, natural gas, oil and oil products through cross-border grids and pipelines.¹⁹⁸ Parties can refer to it, voluntarily, on a case-by-case basis. It will be complementary to other mechanisms for early warning and dispute resolution agreed bilaterally between individual parties. The EWM would help to resolve energy conflicts and thereby enhancing the energy security for energy producing, consuming and transit countries.

¹⁹⁶ The Energy Charter Treaty was signed in December 1994 and entered into force in April 1998. To date the Treaty has been signed or acceded to by 54 contracting parties, including the European Union.

¹⁹⁷ A state or regional Economic Integration Organisation that wishes to accede to the Energy Charter Treaty is required to be a signatory of the 1991 European Energy Charter, the original political declaration that is expected to be adopted together with the Energy Charter Treaty.

¹⁹⁸ Article 2.1 of the Model Energy Charter Early Warning Mechanism, CC 501, 5 November 2014.

10. Conclusions and recommendations

10.1. Challenges

The main challenges of the energy sector in Nigeria are:

- (i) Inadequate infrastructure in the entire energy sector due to insufficient funding by the federal government;
- (ii) Insufficient energy supply to consumers due to low generation capacity and low maximum transmission wheeling capacity;
- (iii) Insufficient gas supply to power plants due to lack of infrastructure for storage and the transportation of gas to power plants;
- (iv) High technical losses due to obsolete transmission and distribution lines, and the transportation of electricity over long distances;
- (v) High commercial losses due to poor billing systems, electricity theft, and vandalization of equipment;
- (vi) Insufficient, investments in the exploration and utilisation of other available sources of energy, especially abundant renewable sources to diversify the energy mix;
- (vii) Frequent power outages and low quality of supply due to unmaintained transmission and distribution networks;
- (viii) Pollution of the environment from gas flaring storage facilities for gas, especially associated gas from exploration of crude oil;
- (ix) Wastage of energy due to non-implementation of energy conservation policies, and non-promotion of energy efficient products;
- (x) Lack of modern communication and monitoring technologies, and inadequate logistics facilities for provision of customer services; and
- (xi) Poor customer relations/services due to the attitudes of the staff of the utilities, as well as lack of training/ capacity building and inadequate facilities.

10.2. Open issues

Many programs and actions are being considered by the Federal Government to make the energy sector more attractive and dynamic for investment, thereby contributing to a more sustainable socio-economic growth for the country.

Presently, the ECN is reviewing the Draft National Energy Masterplan (NEMP), Draft National Renewable Energy & Energy Efficiency Policy (NREEEP), the Draft National Energy Policy, and Draft Renewable Energy Masterplan. The NEMP is being reviewed and validated to “guarantee adequate, reliable and sustainable supply of energy at appropriate cost in and environmentally friendly manner, to the various sectors of the economy. The revised draft...seeks to achieve the goals of the revised National Energy Policy (NEP) by converting its strategies to actionable programmes and activities with timelines in the short, medium and long terms.”

The renewable energy market in Nigeria is still underdeveloped. The NERC is considering the introduction of a feed-in-tariff system in order to encourage further investment. The Commission has already begun the analysis for a draft regulation for the introduction of a feed-in-tariff in collaboration with various other agencies and international organizations, which will be guaranteed by the NBET, the sole bulk electricity buyer for the distribution companies in the country.

The government is also in the process of enacting the Petroleum Industry Bill for the oil and gas sector. The Bill seeks to give the country’s oil and gas industry a comprehensive legal framework, and provides the basis for the unbundling of the Nigerian National Petroleum Corporation (NNPC) into five independent commercial entities, as well as promote transparency and accountability in the operations of the industry.

10.3. Recommendations

Nigeria’s policies and strategies for energy sector development are in line with the principles of International Energy Charter. Considering that Nigeria has a huge and diversified untapped energy potential, and that substantial FDI is required for its development, Nigeria is in a

strong position to begin the process of accession to the International Energy Charter. Further support for this is based on Nigeria's continued work towards creating favourable conditions for liberalisation of the energy market, which provides various incentives for investors (including tax benefits and expatriation of profits, just to name a few).

The national constitution provides for non-discrimination, and as a member of the WTO, Nigeria already follows the main principles of the International Energy Charter. As a result, Nigeria meets the basic conditions to adopt the International Energy Charter and become an observer of the Energy Charter.

Observership is a "light" form of participation in the Energy Charter process.¹⁹⁹ It offers interested non-members the possibility to become more familiar with the Energy Charter Treaty to establish formal contacts with member countries and other observers and participate in the international forum for energy dialogue established by the Energy Charter. Observers do not have any legal obligations under the Energy Charter Treaty. In particular, they do not have to contribute to the budget of the Organization. Observership may be –although not necessarily – a transitional phase towards full membership.

As an observer member, Nigeria would be subject only to a political commitment, pledging to move in the same direction with the principles of International Energy Charter and all of its sector policies, including legal reform.

As a signatory of the International Energy Charter, Nigeria will have the opportunity to extend their participation in the international platform for cooperation on energy and benefit from a wide range of opportunities, including:

- i. Cooperation on technological development and innovation activities in the fields of production, conversion, transmission, distribution and the efficient and clean use of energy, taking into account their obligations and nuclear non-proliferation commitments.
- ii. Programs and activities in the research domain and technological development; dissemination and exchange of relevant information and transfer of know-how on technologies, with particular emphasis on energy efficiency and renewable energy field,

¹⁹⁹ The Energy Charter Treaty: A Reader's Guide (Energy Charter Secretariat; Brussels).

where its relevance to Nigeria has been higher in recent years due to the survey of the country's renewable energy potential and the importance it has on rural electrification in remote areas of the country.

- iii. Institutional training programs for staff linked to the energy sector in the various policy areas, which may extend to academic institutions (that is, vocational, technical and/or higher education institutions) in Nigeria.

Besides that, the International Energy Charter respects the sovereignty of each state over its energy resources, as well as the right to regulate the transmission and the transport of energy in their territories, respecting all relevant international obligations. In the spirit of political and economic cooperation, the International Energy Charter promotes the development of efficient, stable and transparent energy markets, regional and global energy cooperation based on the principle of non-discrimination and commercial-based pricing, taking into account environmental concerns and the role of energy in national development of each country.

As a signatory of the International Energy Charter, Nigeria will be engaged in the implementation of the general principles of the International Energy Charter, which will culminate in the development of two annual reports prepared by officials seconded to the Energy Charter Secretariat, sent by the Government of Nigeria, covering the following themes:

- i. Market Structure and Investment Climate Report; and
- ii. In-Depth Report on Energy Efficiency in Nigeria.

Expansion of the International Energy Charter to more countries in the region is an important step that needs to be implemented. Nigeria is already an integrated country within the ECOWAS region and it would be advantageous that membership to the International Energy Charter include all the member countries in the ECOWAS region. This would facilitate further convergence of the energy policies in the light of the basic principles of the International Energy Charter on an international level.

10.4. Procedure to adopt the International Energy Charter

The previous section pointed out the added value of signing the International Energy Charter. All that is required to adopt it as an international political declaration on energy cooperation is to formally express such desire to the Energy Charter Secretariat in writing, requesting an invitation to formal signing of the International Energy Charter in The Hague in May, 2015. The International Energy Charter can also be signed after that date, following the same procedure.

Bibliography

Reports and Journals:

- African Development Fund. Project Appraisal Report: Partial Risk Guarantee in Support of the Power Sector Privatizations. December, 2013.
- African Development Bank. Partial Risk Guarantee in Support of the Power Sector Privatization. 2013. http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Nigeria_-_Power_Sector_Privatization_Program_-_Appraisal_Report.pdf
- Aina Blankson LP. Marginal Fields in Nigeria: An overview of the Enabling provisions and Fiscal Regime. Newsletter, 2011.
<http://documents.mx/documents/marginal-fields.html>
- Akpu, I.V. Renewable Energy Potentials in Nigeria. International Association for Impact Assessment. 2012.
- ECOWAS Observatory for Renewable Energy and Energy Efficiency. Katsina Wind Farm. <http://www.ecowrex.org/project/katsina-wind-farm-project>
- Energising Access to Sustainable Energy. European Commission Project in Nigeria. http://ec.europa.eu/europeaid/documents/aap/2013/af_aap_2013_nga.pdf
- B, Joseph Sunday. A, Rufus Temidayo. Surface Temperature Anomalies in the River Niger Basin Development Authority Areas, Nigeria. Atmospheric and Climate Sciences. Vol.3, No.4, 2013. http://file.scirp.org/Html/14-4700203_37125.htm
- British Petroleum. Statistical Review of World Energy. Excel workbook of historical data, 2014. <http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy/statistical-review-downloads.html>
- Chevron 2014 Annual Report Supplement.
<http://www.chevron.com/documents/pdf/chevron2014annualreportsupplement.pdf>
- Global Methane, Nigeria: Summary of Coal Industry.
https://www.globalmethane.org/documents/toolsres_coal_overview_ch24.pdf
- Gas to Power – Status and Outlook. Presentation by the Gas Aggregation Company Nigeria Limited http://www.nigeriaelectricityprivatisation.com/wp-content/uploads/downloads/2011/02/Gas_Aggregation_Company_of_Nigeria_Investor_Forum_Presentation.pdf

- International Monetary Fund, Nigeria, IMF Country Report No. 14/103, (April 2014), page 10 and 25.
- J, Ikeme. Assessing the Future of Nigeria's Economy: Ignored threats from the global climate change debacle. African Economic Analysis, De Montfort University, Leicester, UK, 2008.
- KPMG. A Guide to Nigerian Power Sector. December, 2013.
<http://www.kpmg.com/Africa/en/IssuesAndInsights/Articles-Publications/Documents/Guide%20to%20the%20Nigerian%20Power%20Sector.pdf>
- Logistics Capacity Assessment, Nigeria Waterway Assessment.
<http://dlca.logcluster.org/display/public/DLCA/2.5+Nigeria+Waterways+Assessment;jsessionid=D1B5B222AC091772C76197CFFA8CD883>
- National Bureau of Statistics. Nigerian GDP Report, Quarter Four, 2014, Issue 04.
<http://www.nigerianstat.gov.ng/pages/download/272>
- National Bureau of Statistics. Nigeria in 2014: Economic Review and 2015-2017 outlook. www.nigerianstat.gov.ng/pages/download/263
- National Bureau of Statistics. Foreign Trade Statistics, Fourth Quarter, 2014, 02/23/2015, ISSN0734-3954, No 513.
<http://www.nigerianstat.gov.ng/pages/download/274>
- National Bureau of Statistics. Capital importation Summary Report 2007-2014.
www.nigerianstat.gov.ng/pages/download/211
- Presidential Task Force on Power. Roadmap for Power Sector Reform.
<http://www.nigeriapowerreform.org/content/Roadmap%20for%20Power%20Sector%20Reform%20-%20Revision%201.pdf>
- U.S. Energy Information Administration (EIA) International Energy Agency Country Analysis: Nigeria. <http://www.eia.gov/countries/analysisbriefs/Nigeria/nigeria.pdf>
- OPEC, Member Countries' Crude Oil Production Allocations,
www.opec.org/opec_web/static_files_project/media/downloads/data_graphs/ProductionLevels.pdf
- Secretariat of the Organization of the Petroleum Exporting Countries, Annual Statistical Bulletin 2013.
<http://www.nnpcgroup.com/Portals/0/Monthly%20Performance/2013%20ASB%201st%20edition.pdf>

- Secretariat of the Organization of the Petroleum Exporting Countries, Annual Statistical Bulletin 2014.
http://www.opec.org/opec_web/static_files_project/media/downloads/publications/ASB2014.pdf
- Secretariat of the Organization of the Petroleum Exporting Countries, Nigeria facts and figures. http://www.opec.org/opec_web/en/about_us/167.htm
- Sambo, A.S. Strategic Developments in Renewable Energy in Nigeria. International Association for Energy Economics. 2009.
- The Encyclopedia of Earth, The Energy Profile of Nigeria.
<http://www.eoearth.org/view/article/152513/>
- Vergnet Group. Katsina Wind farm. <http://www.vergnet.com/pdf/fiches/en/nigeria-katsina.pdf>
- The Energy Charter Treaty: A Reader's Guide (Energy Charter Secretariat; Brussels).
- World Bank Global Economic Prospects for Sub-Saharan Africa.
http://www.worldbank.org/content/dam/Worldbank/GEP/GEP2014b/GEP2014b_SSA.pdf
- Worldwide Look at Reserves and Production. Oil & Gas Journal. (January 1, 2015).

Press:

- African Development Bank. ADF partial risk guarantee program to stimulate private investment in the Nigerian power sector. December 18, 2013.
<http://www.afdb.org/en/news-and-events/article/adf-partial-risk-guarantee-program-to-stimulate-private-investment-in-the-nigerian-power-sector-12708/>
- BBC. Nigeria: How noisy generators became a way of life. 22 November 2013.
<http://www.bbc.com/news/world-africa-25056721>
- Bloomberg Business. Nigeria in Rosatom Talks for Up to \$80 Billion Nuclear Power.
<http://www.bloomberg.com/news/articles/2015-04-14/nigeria-signs-rosatom-deal-for-up-to-80-billion-nuclear-power>
- CEIC News Alert, Nigeria Becomes Largest Economy in Africa after GDP Rebase. April 30, 2014. <http://www.ceicdata.com/en/blog/ceic-newsalert-nigeria-becomes-largest-economy-africa-after-gdp-rebase>

- Deutsche Welle. Nigerians turn to renewable energy as solution to power crisis.
<http://www.dw.de/nigerians-turn-to-renewable-energy-as-solution-to-power-crisis/a-18216818>
- Financial Times. Europe Plays catch-up in race for gas. September 17, 2008.
<http://www.ft.com/cms/s/0/630c6f4e-841f-11dd-bf00-000077b07658.html#axzz3UwYHhk3G>
- Gas Flaring: The Burning Issue. Resilience.org.
<http://www.resilience.org/stories/2013-09-03/gas-flaring-the-burning-issue>
- International Finance Corporation. World Bank Group Launches the Lighting Africa Program for Nigeria. March 10, 2015.
<http://ifcext.ifc.org/IFCExt/pressroom/IFCPressRoom.nsf/0/D3C00B7394A8D59E85257E0400319C58?OpenDocument>
- The Guardian, Court bars states on issuance of EIA approval certificate. February 22, 2015. <http://www.ngrguardiannews.com/2015/02/court-bars-states-on-issuance-of-eia-approval-certificate/>
- The Guardian. The light is getting brighter in Nigeria.
<http://www.theguardian.com/global-development-professionals-network/adam-smith-international-partner-zone/nigeria-power-electricity-africa>
- Nigeria Gas flared and Cost Implications. BusinessDay. July 30, 2014.
<http://businessdayonline.com/2014/07/nigeria-gas-flared-and-cost-implication/#>
- Proactive investors. Astra Resources uncovers new growth opportunity in Nigerian Coal. February 20, 2012.
<http://www.proactiveinvestors.com.au/companies/news/25509/-astra-resources-uncovers-new-growth-opportunity-in-nigerian-coal--25509.html>
- Huffington Post. Why Nigeria Generates so little power.
http://www.huffingtonpost.com/timi-soleye/why-nigeria-generates-so-_b_5695091.html
- Nigeria's US\$1.3 billion 700-MW Zungeru hydroelectric project deals with challenges. December 12, 2014. HydroWorld.com.
<http://www.hydroworld.com/articles/2014/12/nigeria-s-us-1-3-billion-700-mw-zungeru-hydroelectric-project-deals-with-challenges.html>
- Jeune Afrique. Côte d'Ivoire : la production de gaz naturel a doublé en un an. November 4, 2013. <http://economie.jeuneafrique.com/regions/afrique->

subsaharienne/20450-cote-divoire--la-production-de-gaz-naturel-a-double-en-un-an.html.

- Stratfor Global Intelligence. Powering Africa's Economies: Prospects for Growth in Electricity Markets. August 18, 2014. <https://www.stratfor.com/analysis/powering-africas-economies-prospects-growth-electricity-markets>
- Thisday. AfDB Provides \$200m Guarantee for Nigeria's Coal-to-Power Projects. Mar 20, 2015. <http://www.thisdaylive.com/articles/afdb-provides-200m-guarantee-for-nigeria-s-coal-to-power-projects/204604/>
- Vanguard. The Challenges of the Nigerian electric power sector reform. February 26, 2013. <http://www.vanguardngr.com/2013/02/the-challenges-of-the-nigerian-electric-power-sector-reform-1/#sthash.WJzorP71.dpuf>
- Vanguard. Nigeria spends N3.5trn annually on power generators. 16 January, 2013. <http://www.vanguardngr.com/2013/01/nigeria-spends-n3-5trn-annually-on-power-generators/>

Legal sources:

- Constitution of the Federal Republic of Nigeria
- Petroleum Act
- Electric Power Sector Reform Act
- Nigerian Minerals and Mining Act
- National Environmental Standards And Regulations Enforcement Agency Act
- River Basins Development Authorities Act
- Hydroelectric Power Producing Areas Development Commission
- Deep Offshore and Inland Basins Production Sharing Contracts Act
- Companies Income Tax Act
- Nigerian Atomic Energy Commission Act
- Public enterprises Privatisation and Commercialisation Act
- Oil Pipelines Act
- Environmental Impact Assessment Decree No 86 of 1992
- Water Resources Act
- Oil and Gas Export Free Zone Act
- Nigerian Export Promotion Council Act

- Export (Incentives and Miscellaneous Provisions) Act
- Nigerian Investment Promotion Commission Act
- National Inland Waterways Act
- Public Procurement Act
- Renewable Energy Master Plan

Websites:

- Action Nigeria. <http://www.actionnigeria.com/>
- Adam Smith International. <http://www.adamsmithinternational.com/explore-our-work/west-africa/nigeria>
- Cedigaz, Statistical Database, 2013. <http://www.cedigaz.org/products/natural-gas-database.aspx>
- CIA Factbook on Nigeria. <https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html>.
- Department of Petroleum Resources. <https://dpr.gov.ng>
- Development Tracker. <http://devtracker.dfid.gov.uk/countries/NG/projects/>
- Doing Business in. <http://www.doingbusinessin.fr>
- Federal Republic of Nigeria National Assembly. <http://www.nassnig.org>
- French Agency of Development. <http://www.afd.fr/lang/en/home/pays/afrique/geo-afr/nigeria/nigeria-projets>
- GIZ. Nigerian Energy Support Programme. <http://www.giz.de/en/worldwide/26374.html>
- Global Energy Network Institute. <http://www.geni.org>
- International Centre for Nigerian Law. <http://www.nigeria-law.org>
- Law Nigeria. <http://lawnigeria.com/>
- Ministère de L'énergie Algérie, Project NIGAL. http://www.mem-algeria.org/francais/index.php?page=presentation_nigal
- National Energy Council. <http://energycouncil.gov.ng/default.aspx>
- Nigerian National Petroleum Corporation. <http://www.nnpcgroup.com>
- Nigerian Nuclear Regulatory Authority. http://www.nnra.gov.ng/page-about_us
- Nigerian Investment Program Commission. <http://nipc.gov.ng/>

- National Environmental Standards And Regulations Enforcement Agency.
<http://www.nesrea.org/about.php>
- Nigeria Export Processing Zones Authority.
<http://www.nepza.gov.ng/downloads/NEPZA631992.pdf>
- Nigeria LNG. <http://www.nigerialng.com/>
- Nigerian Electricity System Operator. <http://www.nsong.org/>
- Nigerian Infrastructure Advisory Facility. <http://niafng.org/sectors-2/power/>
- Nigeria Export Processing Zones Authority. <http://www.nepza.gov.ng>
- Nigeria Electricity Regulatory Commission. <http://www.nercng.org/>
- Niger Delta Power Holding Company. http://ndphc.net/?page_id=2900 &
http://ndphc.net/?page_id=3429
- OandO PLC. <http://www.oandopl.com/>
- Open Energy Information. <http://en.openei.org/wiki/Nigeria>
- Presidential Task Force on Power. <http://www.nigeriapowerreform.org>
- Platts. <http://www.platts.com>
- REEEP. <http://www.reeep.org/projects/development-international-energy-management-standards-integration-iso-9000>
- Japan International Cooperation Agency.
<http://www.jica.go.jp/nigeria/english/activities/activity01.html>
- USAID. <http://www.usaid.gov/powerafrica/>
- United Nations Conference on Trade and Development, Investment policy hub.
<http://investmentpolicyhub.unctad.org/IIA/CountryBits/153>
- United Nations Industrial Development Organisation. <http://www.unido.org>
- West African Gas Pipeline Authority. <http://wagpa.org/wagpa.html>
- West African Gas Pipeline Company. <http://www.wagpco.com>
- World bank database. <http://data.worldbank.org/>