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Scenario of Electricity in Nigeria

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Abstract-This paper presents the background analysis of the present scenario of electricity in Nigeria and investigates the current status of the energy resources and the trend of electric power generation in Nigeria. The dynamic world depends on electric energy which propels the socio-economic activities, science and technology, and nation's infrastructure. Therefore, it becomes imperative to investigate into the scenario of electric power in order to proffer dependable solution s to the problems militating against the reliable, effective and efficient electric power supply in Nigeria. The results of this research work will aid power system planning and solving power generation problems including making the PHCN to supply reliable, affordable, stable and safe electricity.

Keywords: **- Electricity, Generation, Transmission, Energy demand, Distribution.**

I.INTRODUCTION

The present-day civilization of mankind is closely interwoven with electrical energy. Electricity is the highest grade of energy. It is vital for economic growth, national development and improvement of standard of living. In the energy hierarchy, electricity occupies the top position. It is conveniently applicable in homes, industries, science and technology. It is considered superior to all other forms of energy due to its easy control, convenient and efficient transmission, flexibility, cheapness versatile form and cleanliness. Nigeria is blessed with abundant natural resources. Despite the abundance of energy resources in Nigeria, the country is short of electrical power.40% only of the nation's 150 million population has access to the electricity. Sequel to dramatic increase in population growth and ever increasing demand for electricity, the electricity demand in Nigeria far outstrips the supply and the supply is epileptic in nature. The availability of electricity drops to 15% in the rural areas where 70% of the entire population lives. The country is faced with acute electricity problems, which is hindering its development notwithstanding the availability of vast natural resources in the country. It is widely accepted that there is a strong correlation between socio-economic development and the availability of electricity. Emphasis has shifted to electricity as an energy input with the economic importance of stimulating socio-economic and technological development in an economy. Adequate power supply is a sine-qua-non to any nation's development, and electricity generation, transmission and distribution are capital-intensive activities requiring huge resources of both funds and human capital. In the prevailing circumstances in Nigeria where funds availability is progressively dwindling, creative and innovative solutions are required to address the electric power supply problem. The demand for electricity in Nigeria is squarely for industrial, commercial and residential purposes. It is worthy to note that electricity consumption by the domestic sector has dominated other sectors since 1978, while the industrial sector's demand has witnessed continuous downward trend [3]. The fall in the industrial sector's demand for electricity can be attributed to inadequate power supply which has forced manufacturers to resort to privately generated electricity for powering their production processes. Due to the recent reforms embarked on by government to revamp electricity supply in Nigeria, it becomes important to model the key drivers of electricity demand in Nigeria in order to obtain empirical insights for electricity demand and supply projection and policy analysis. The empirics on the demand for electricity consumption has mostly been analyze at a disaggregated level, focusing on the residential demand with the inclusion of structural and demographic factors such as population, urbanization, climatic conditions along with economic factors like real income and electricity price (tariff), which are identified as the primary determinants of electricity demand. The relevance of the results of such studies depends largely on the choice of variables, econometric methods, data frequency and a country's developmental stage. Nigeria is has a total of 356, 667 sq miles (923,768 sq km), of which 351,649 sq miles (910,771 sq km or 98.6% of total area) is land. The country, Nigeria has six Geo-Political Zones, which is subdivided into 36 states and the Federal Capital Territory (FCT).The vegetation cover, physical features and land terrain in the nation differs from flat open savannah in the North to thick rain forests in the south, with many rivers, lakes and mountains scattered all over the country. These national physical and political attributes present challenges and problems for the effective provision of power needs to all nooks and crannies of the country. An estimated 176 trillion cubic feet of proven natural gas reserves is endowed in the country, making the country one of the top ten natural gas endowments in the world and the largest endowment in the African Continent. In order to provide adequate power and ensure that Nigeria is among the industrialized nations, there must be:

• Adequate power generation
• The power must reliable and effectively be transmitted to all parts of the country.
•Efficient and safe distribution of electric power to the consumers.

These factors are unavoidable prerequisite to any nation's development, and electricity generation, transmission and distribution are capital-intensive activities requiring huge resources of both funds and man-power. The administration of President Good luck Ebele Jonathan has

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already unveiled a mission, setting an agenda of industrializing Nigeria by 2020.

II.OBJECTIVE OF THE STUDY

Specifically, this study has the following objective:

- To review the present status of the power system in Nigeria.
- To examine the energy resources in the country
- To provide dependable data for strategic planning in the power sector.

III.METHODOLOGY

- Data were obtained from the PHCNs logbooks, Reports, Visitaion to transmission stations, line survey and interaction with PHCNs staff.
- Administration of questionnaires and interview guide.
- Related literatures
- Data generated from the questionnaire were analyzed using descriptive tools.

IV.HISTORY OF ELECTRICITY IN NIGERIA

The history of electricity in Nigeria can be traced from 1896 when electricity was first produced in Lagos, fifteen years after its introduction in England. Despite the fact that its existence in the country is over a century, its development has been at a slow rate due to uncivillization. In 1950, a central body was established by the legislative council, which transferred electricity supply and development to the care of the central body known as the Electricity Corporation of Nigeria (ECN) in 1951.The Native Authorities and Nigeria Electricity Supply Company (NESCO) were licensed to produce electricity in some locations in Nigeria. In 1962, the Niger Dams Authority (NDA) established by an act of parliament for the development of hydro power. The Authority was responsible for the construction and maintenance of dams and other works on the River Niger and elsewhere generating electricity by means of water power, improving and promoting fish brines and irrigation. The energy produced by NDA was sold to the Electricity Corporation of Nigeria for distribution and sales at utility voltages. In 1972,the ECN and NDA was merged to form the National Electric Authority(NEPA),which was empowered to control the power sector. Sequel to the reform process, the NEPA was renamed Power Holding Company of Nigeria (PHCN) in 2005. In March 2005, President Olusegun Obasanjo signed the Power Sector Reform Bill into law, enabling private companies to participate in electricity generation, transmission, and distribution. The government unbundled the PHCN into eleven distribution firms, six generating companies, and a transmission company, all of which will be privatized. However, several problems, including union opposition, have delayed the privatization, which was later rescheduled for 2006. In February 2005, the World Bank agreed to provide PHCN with $100 million to assist in its privatization efforts. The Nigerian government has made frantic effort to increase foreign participation in the electric power sector by commissioning independent power projects (IPPs) to generate electricity and sell it to PHCN. Prior to 1999, the power sector *in* Nigeria did not witness substantial investment in infrastructural development. At this period, the power sector was in deplorable state, new plants were not built and the existing ones were not properly maintained. In 2001, generation dwindled from the installed capacity of about 5,600MW to an average of about 1.750MW, as compared to a load demand of 6, OOOMW. Also, only nineteen out of the seventy-nine installed generating units were in operation [5]. In 1979 the Energy Commission of Nigeria (ECN) was established by Act No. 62 of 1979, as amended by Act No. 32 of 1988 and Act No. 19 of 1989, with the statutory mandate for the strategic planning and co-ordination of national policies in the field of energy in all its ramifications. Thus, as a result of this mandate, the ECN is the government organ empowered to carry out overall energy sector planning and policy co-ordination. As part of its contribution to the resolution of the problems of the electricity sector along the line of its mandate, the ECN has been collaborating with the International Atomic Energy Agency (IAEA) under an IAEA regional project titled "Sustainable Energy Development for Sub-Saharan Africa (RAF/0/016)".This project emphasized on capacity building for energy planning and the determination of the actual energy demand and the strategies for supply for each participating country over a 30-year time horizon. Hence this project requires the establishment of a Working Team (WT) and a Country Study Team (CST) both of which include the major public and private stakeholders in the energy sector of the country. The working team consists of technical experts that directly implement the project and reports to the CST that serves as the steering committee for the project on a regular basis. Members of the WT were trained on the use of the IAEA models and have computed the Nigeria energy demand and supply projections covering the 2005-2030.

V.NIGERIA POWER INFRASTRUCTURE

Electrical energy generated in Nigeria can be through conventional or unconventional means; thermal (fossils or nuclear power) and non- thermal (hydro, steam) generating station. Electricity energy production in Nigeria over the last 40 years varied from gas –fired, oil – fired, hydroelectric power stations to coal-fired with hydroelectric power system and gas – fired system taking precedence. This is predicated by the fact that the primary fuel sources (coal, oil, water, gas) for these power stations. These stations are usually situated far away from the load centre which then, necessitates an extensive power supply network between the generating stations

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and the consumers' load centre. But proximity to load is very important to prevent transmission cost and power losses. The electrical power system in the country can be divided into three parts: generation, primary and secondary transmission, and primary and secondary distribution. In Nigeria, power is generated at about 11kV -16kV , step-up transformers is employed to transform the voltage to a large value that is suitable for transmission over a long distance to prevent voltage losses along the transmission line. The amount of voltage transmitted over a long distance must be large enough to ensure economic transmission. (Gupta, 2005). Power transmission in Nigeria is in the range of 330KV and 132KV. This power is transmitted through a carefully designed network that affords high efficiency by making sure that the line loss is minimal. System voltage of as high value as 132KV or 330KV cannot be used by consumer, hence, there is a need for stepping the voltage down to as low value as needed by the consumer. At the large load center, which could be 132/33kV or 132/11kV station, the system voltage is stepped-down to 33KV and then routed to different district ingestion stations that are responsible for feeding the consumers at a voltage of 415V/240V. This is made possible with the use of power transformers that steps-down the voltage to240V/415V single phase/three phase system. This level is the distribution level of the power system. In essence, electrical power system is made up of all activities involved in generation transmission and distribution of electric power. It is therefore, the combination of generation, transmission and distribution of electric power. Generation of electricity is based on the principle of electromagnetic induction, which entails that electricity is produced whenever a conductor cuts magnetic flux or whenever magnetic flux cuts a conductor in the magnetic field. This principle is the Faraday law of electromagnetic induction which is established by rotating a conductor in a magnetic field and then measure the terminal voltage i.e. the induced e.m.f of the system .The energy from nuclear fission can also provide energy to produce steam for turbines. The Nigerian power sector is controlled by government-owned Power Holding Company of Nigeria (PHCN), formerly known as the National Electric Power Authority (NEPA). In March 2005, President Olusegun Obasanjo signed the Power Sector Reform Bill into law, enabling private companies to participate in electricity generation, transmission, and distribution. The government has unbundled PHCN into eleven distribution firms, six generating companies, and a transmission company, all of which will be privatized. Several problems, including union opposition, have delayed the privatization, which was later rescheduled for 2006. In February 2005, the World Bank agreed to provide PHCN with $100 million to assist in its privatization efforts. The Nigerian government has made an effort to increase foreign participation in the electric power sector by commissioning independent power projects (IPPs) to generate electricity and sell it to PHCN.

From 2005, the Nigeria power sector has witnessed tremendous infrastructural development." In April 2005, Agips 450-MW plant came online in Kwale in Delta State. The NNPC and Joint Venture (JV) partners, ConocoPhillips and Agip, provided the $480 million to construct the plant. The Nigerian government also approved the construction of four thermal power plants (Geregu, Alaoji, Papalanto, and Omotosho), with a combined capacity of 1,234 MW to meet its generating goal of 6,500 MW in 2006. The IPPs currently under construction include the 276-MW Siemens station in Afam, Exxon Mobils 388-MW plant in Bonny, ABBs 450-MW plant in Abuja, and Eskoms 388- MW plant in Enugu. Several state governments have also commissioned Oil majors to increase generation including Rivers State, which contracted Shell to expand the 700-MW Afam station. In addition fourteen hydroelectric and Natural Gas plants were planned for kick-up but yet to commence since then. Chinas EXIM Bank Su Zhong and Sino Hydro have committed to funding the Mambilla (3,900-MW) and Zungeru (950-MW) hydroelectric projects. In addition, Sino Hydro proposed that it should construct the two power projects. Also, NNPC, in a JV with Chevron are to construct a 780-MW gas-fired thermal plant in Ijede, Lagos State. The project is expected to be constructed in three phases, with the first two phases expected to have capacity of 256 MW each. The plant is expected to be operational in 2007 but yet to commence construction. While Nigerians development of the Oil sector has been good for the country's economy, oil sector development has had an adverse impact on the country's environment. Oil extraction in the Niger Delta region has caused severe environmental degradation, owing to the legacy of oil spills, lax environmental regulations, and government complicity during military regimes that once governed the country. Although the situation is improving with more stringent environmental regulations for the oil industry, marine pollution is still a serious problem. Sambo noted that the use of solid biomass, such as fuel wood, is prevalent and constitutes a major energy source for rural Nigerians. The production and consumption of commercial renewable energy in Nigeria remains quite limited. With Nigerians population continuing to increase, the pressure on the country's environment appears likely to increase as well, even with the added focus on cleaning up the Niger Delta and tightening environmental laws and regulations.

VI.ELECTRIC ENERGY RESOURCES IN NIGERIA

Nigeria is a country that is blessed with a lot of resources such as coal, oil, natural gas, water and other renewable energy sources that can be used to generate electricity.

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A. New and Renewable Energy

Nigeria is endowed with abundant renewable energy resources, the significant ones being solar energy, biomass, wind, small and large hydropower with potential for hydrogen fuel, geothermal and ocean energies. Except for large scale hydropower which serves as a major source of electricity, the current state of exploitation and utilization of the renewable energy resources in the country is very low, limited largely to pilot and demonstration projects. The main constraints in the rapid development and diffusion of technologies for the exploitation and utilization of renewable energy resources in the country including the absence of market and the lack of appropriate policy, regulatory and institutional framework to stimulate demand and attract investors. The comparative low quality of the systems developed and the high initial upfront cost also constitute barriers to the development of markets.

B.Oil

Nigeria is Africa's most prolific oil- producing country, which, together with Libya, accounts for two- thirds of Africa's crude oil reserves. It ranks second to Algeria in natural gas. Most of Africa's bitumen and lignite reserves are found in Nigeria. It is not surprising; therefore, that oil export is the mainstay of the Nigerian economy. Oil exploration in Nigeria witnessed steady growth over the past few years. It has been recorded that Nigeria had a proven reserve of 25 billion barrels of predominantly low sulphur light crude in 1999. It has substantially increased to 34 billion barrels in 2004 and currently is about 36.5 billion barrels. The growth in the nation's reserves is attributable to improved funding of Joint payment of cash call arrears, introduction of an alternative funding scheme, the emergence of new production sharing arrangements and the opening up of new frontier and deepwater / offshore blocks. Based on various oil prospects already identified especially in the deepwater terrain and the current (2006) development efforts, it is projected that proven reserves will reach about 45billion barrels by year 2015 and potentially 68 billion barrels by year 2030. Oil production in the country also increased steadily over the years; however, the rate of increase is dependent on economic and geopolitics in both producing and consuming countries. Nigeria's current production is more than 2.4 million barrels per day even though actual production is averaging around 2.4 million barrels per day partly due to the problems in the Niger Delta and OPEC production restriction. Average daily production is projected to increase to 4.0 million barrels per day by 2010 and potentially to over 5.0 million per day in year 2030. The Federal Government also established petrochemical and fertilizer plants. The capacity utilization of these plants and facilities has been considerably low, due to the high level of decay arising from adequate trained manpower, poor maintenance and operating conditions, under -funding, criminal vandalization especially on the pipelines, and the various companies' lack of management autonomy for efficient operation. However, these high potentials will be realized only with the adoption of high exploration strategic development policies and programmes covering the inland basins of Niger Delta, Anambra, Benin (Dahomey), Benue and Chad Basins, the offshore continental shelves and deepwater offshore terrains. In the downstream oil sub-sector, Nigeria has four refineries with a total installed capacity of 445,000 barrels per day and 5001 km network of pipeline from the refineries to 22 oil depots. Consequently, annual domestic demand for petroleum products is not fully met by internal production and has to be supplemented by imports.

C. Natural Gas

Nigeria's natural gas reserves is estimated at about 187.44 trillion standard cubic feet in 2005, are known to be substantially larger than its oil resources in energy terms. Gas utilization is a primary goal of Nigeria's petroleum and energy policies. This is because, with a proven reserve of 260 trillion cubic feet of natural gas, Nigeria's gas reserve is triple the nation's crude oil resources. Hitherto, associated gas encountered during the normal course of oil production has been largely flared. Nigeria is reputed to be the largest gas-flaring country in the world. By not fully harnessing its gas resources, Nigeria loses an estimated 18.2 million U.S. dollars daily. However, gas flaring was reduced to about 36% as a result of On its part, the Nigerian Ministry of Petroleum Resources, in addition to imposing penalties which were intended to end gas flaring by 1994, has offered incentives to potential investors who are interested in gas exploration. Since the 1980s, there has been increasing utilization of gas in Nigeria, for power generation, industrial heating, fertilizer and petrochemical manufacturing and as feedstock for direct steel reduction. But the largest gas users will be the Liquefied Natural Gas (LNG) Project and the Aluminum Smelting Industry. Nigeria's LNG project had been on the drawing board since the 1960s. It was not until 1990 that the NNPC concluded financial arrangements for the project. Established in 1992, the Nigerian Liquefied Natural Gas Company com menaced execution of the project in 1993. The shipment of gas from the Bonny Plant to overseas buyers in Europe commenced late in 1999. The Nigerian Gas Company, the gas marketing subsidiary of the NNPC, has signed a 10 billion Naira gas sale agreement with Shell, involving the later marketing gas from its Utorogu gas plant. To augment Government's commercialization efforts. Chevron has embarked upon the Escravos Gas Utilization project in which it will process about 160 billion standard cubic feet (MSCF) of gas daily from the company's Mefa and Okan fields. The project entails the installation of gas gathering and extraction facilities at the Escravos terminal. About 130 MSCF of dry residue gas will also be available daily from this project to the Nigerian Gas Company for commercial

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and domestic use. Gas discoveries in Nigeria are incidental to oil exploration and production activities. Consequently as high as 75% of the gas produced was being flared in the strident efforts by the Government to monetize natural gas. Domestic utilization of Natural gas is minor power generation which accounted for over 80% while the remaining is in the industrial sector.

D. Coal

Coal was first discovered in Nigeria in 1909. Coal mining in Nigeria began in 1916 with a recorded output of 24,500 tons. Nigeria's coal reserves are large and estimated at 2 billion metric tones of which 650 million tones are proven reserves. In the first and second quarters of twentieth century, about 95% of Nigeria's coal production has been consumed locally; mainly for railway transportation, electricity production and industrial heating in cement production. It is estimated that Nigeria has 176 trillion cubic feet of proven natural gas reserves, giving the country one of the top ten natural gas endowments in the world and the largest endowment in Africa. Production rose to a peak of 905,000 tones in the 1958/59 with a contribution of over 70% to commercial energy consumption in the country. Available data show that coal of sub-bituminous grade occurs in about 22 coal fields spread in over 36 States of the Federation. The proven coal reserves so far in the country are about 639 million tones while the inferred reserves are about 2.75 billion tones. The discovery of crude oil in commercial quantities in 1958 and the conversion of railway engines from coal to diesel contributed major reduction in the production of coal from the beginning of the 60s to only 52,700 tunes in 1983 and contributed about 0.02% to commercial energy consumption in the country in 2001. The Nigeria's coal can be utilized for various purposes including; power generation, steam production, in cement production and for brick making; as a heat source and reducing agent for steel production; as a domestic fuel; and a feedstock for the production of chemicals, liquid fuels, gaseous fuels, batteries, carbon electrodes, etc. These potentials of coal need to be effectively harnessed into the country's energy delivery system and export commodity mix through the development of a vibrant coal industry.

VII.IMPROVING ELECTRIC POWER SYSTEM IN NIGERIA

Government of Nigeria has been making concerted efforts to address the power problem in the country. To this end, there are plans to improve on electricity generation, transmission and distribution in order to ensure, safe, sustainable and uninterrupted power supply. In the medium term, there were plans to share-up the generation capacity to 10,000MW by the end of the year 2015 and40,000MW by the end of 2030..Furthermore; the government has been carrying the reform and privatization programme The private sectors are now involve in electricity generation and distribution. The involvement of the private sector will no doubt help to improve the electricity supply for industrial, commercial and domestic uses. Foreign investors are currently being encouraged in the power sector (Abubakar and Kemjita, 2001).Table 1 & 2 are shown in Appendix.

VIII.RESULTS AND DISCUSSION

Poor industrialization and dwindling economic growth in Nigeria was attributed to unreliable, inadequate and unsafe power supply. It has been projected that the demand will drastically increases equal to the anticipated increase in socio-economic development activities in the country, especially in the manufacturing and commercial sub-sector. The current situation is that generation is still lower than consumer's demand. The availability of electricity drops to 15% in the rural areas where 70% of the entire population lives. Moreover, not all the electric power generated is transmitted or distributed, hence, the lower available power for consumption. Despite the higher generating capacity vis-à-vis demands, 40% of Nigerians especially those in the rural areas are without electricity. The government has made a greater impact by embarking upon the power sector reform and privatization programmes to encourage foreign investors and private participation. The government planned to put in place 24,106,00MW of generation infrastructure in Nigeria. In table 1, the overall planned total present and future electricity generation infrastructure in Nigeria is depicted. The power generating stations in Nigeria have an average availability factor less than 40 per cent, performance rate of less than 38 per cent and quality rate of less than 30 per cent. This implies that for every 100 days, the plants would be available for operation in less than 40 days. The very low level of operation performance and quality rate is an indication that efficient operation of the Nigeria generating plants is very much below expectation. It has been noted that the share of hydropower (large and small) in the total installed capacity will decrease from 31.30% in2005 to about 11 % in 2030, while the share of natural gas based power capacity in will increase from 68.30% in 2005 to 82.15% in 2010 and thereafter decrease to 62.95% in 2030. Coal and nuclear, will account for 15.6 and 6.7% by 2030, respectively. Solar and wind are also projected to account for 8.3% and 1.8% respectively by 2030. However, table 2 indicated the projected electricity demand from 2005-2030 using International Atomic Energy Agency(IAEA)-Model for the Energy Supply Strategy Alternatives and their General Environment Impact(MESSAGE).The result revealed that the country will have a total grid capacity of24, 106.00 MW of electricity by the end of December,2012,if the ongoing projects are completed. This would improve the availability of electricity and access to the power system.

IX.CONCLUSION

This study has in essence introduced an outline of the basic power scenarios in Nigeria; It took a cursory look at

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the level of building infrastructure for the power sector in Nigeria and emphases that the Federal Government alone cannot provide this level of funding. Indeed, the state governments, the local government, private sector and foreign investors must be involved. Moreover, all the country's energy resources need to be deployed in order to achieve matching supply with demand on a continuous basis. Therefore, the power economy can be said to still be in its infant stage. What needs to be done is create competitive environment in the power sector, embark upon full deregulation and energy mix. Low level of access to electricity in the rural areas could be minimized through integration of renewable energy resources such as solar, wind and biomass in the Nigerian power system.

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TABLE 1: TOTAL PRESENT AND FUTURE ELECTRICITY GENERATION INFRASTRUCTURE IN NIGERIA

S/N	POWER STATION	TYPE	STATE	CAPACITY (MW)	STATUS
1	Egbin	Thermal	Lagos	1320.00	Existing
2	Afam	Thermal	Rivers	969.60	Existing
3	Sapele	Thermal	Delta	1020.00	Existing
4	Ijora	Thermal	Lagos	40.00	Existing
5	Kainji	Hydro	Niger	760.00	Existing
6	Jebba	Hydro	Niger	578.40	Existing
7	Shiroro	Hydro	Niger	600.00	Existing
8	Delta	Thermal	Delta	912.00	Existing
9	Orji	Coal	Rivers	20.00	Existing
10	Geregu	Thermal	Kogi	414.00	Ongoing
11	Omotosho	Thermal	Ondo	335.00	Ongoing
12	Papalanto	Thermal	Ogun	335.00	Ongoing
13	Alaoji	Thermal	Abia	504.00	Ongoing
14	Omoku	Thermal	Rivers	230.00	New IPP
15	Rain/Ube	Thermal	Bayelsa	225.00	New IPP
16	Sapele	Thermal	Delta	451.00	New IPP
17	Eyaen	Thermal	Edo	451.00	New IPP
18	Egbema	Thermal	Imo	338.00	New IPP
19	Caliber	Thermal	Cross River	561.00	New IPP
20	Mambilla	Hydro	Delta	2600.00	New
21	Zungeru	Hydro	Rivers	950.00	New
22	AES	Thermal	Kogi	300.00	Commissioned IPP
23	AGIP Okpai	Thermal	Delta	480.00	Commissioned IPP
24	Omoku	Thermal	Rivers	150.00	Approved IPP
25	Obajama	Thermal	Kogi	350.00	Approved IPP
26	Ibom Power	Thermal	Akwa Ibom	188.00	Approved IPP
27	Ethiope Energy Supply			2800.00	Approved Licenses IPP
28	Farm Electric Supply Ltd			150.00	Approved Licenses IPP
29	ICS Power			624.00	Approved Licenses IPP
30	Supertek Ltd			1000.00	Approved Licenses IPP
31	Mabon Ltd			39.00	Approved Licenses IPP
32	Geometric Ltd			140.00	Approved

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					Licenses IPP
33	Aba Power Ltd			0.00	Licensed Distributor
34	Westcom Tech & Energy Service Ltd			1000.00	License Granted IPP
35	Lotus & Bresson Nig Ltd			60.00	License Granted IPP
36	Anita Energy Ltd			136.00	License Granted IPP
37	First Independent Power Co Ltd			95.00	License Granted IPP
38	First Independent Power Co Ltd			150.00	License Granted IPP
39	Hudson Power Station Ltd				License Granted IPP
40	Ibafo Power Station				License Granted IPP
41	Shell Distribution Co Ltd			100.00	LicenseGranted IPP
42	Agbara Shoeline power Co.ltd			1800.00	License Granted IPP
43	Index thermal power ltd.			1800.00	License Granted IPP
	TOTAL			**24,106.00**	

TABLE 2: ELECTRICITY DEMAND PROJECTIONS (MW)

Scenario	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Reference (7%)	5.746	15,730	28,360	50,820	77,450	119,200
High Growth (10%)	5.746	15,920	30,210	58,180	107,220	192,000
Optimistic 1 (11.5%)	5.746	16,000	31,240	70,760	137,370	250,000
Optimistic II (13%)	5.746	33,250	64,200	107,600	172,900	297,900
Presidential						
Pronouncement						