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Review

Electricity Policy as a Planning Tool for Sustainable Development in Nigeria.

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Abstract: Electricity is a critical economic infrastructure essential for sustainable development, yet inadequate supply remains a serious challenge to Nigeria's socio-economic progress. This review paper aims to describe and analyze the evolution of various electricity policies implemented in Nigeria, identify their achievements, and determine the major barriers encountered. The study synthesizes historical and contemporary policy provisions, from the pre-colonial establishment of the Electricity Corporation of Nigeria (ECN) and Niger Dam Authority (NDA) to the post-independence National Electric Power Authority (NEPA). Key modern policy frameworks reviewed include the National Economic Empowerment and Development Strategy (NEEDS), the National Energy Policy (NEP), and the landmark Electric Power Sector Reform (EPSR) Act of 2005, which led to the unbundling of NEPA and the establishment of the Nigerian Electricity Regulatory Commission (NERC). Achievements derived from these reforms include the licensing of approximately 40 independent power producers (IPPs) and the development of a strategic 5-year plan aimed at increasing generation capacity to 35,000 MW by 2020. However, implementation faces significant policy and regulatory barriers, financing and investment challenges, technological setbacks, and critical grid instability. The paper concludes that a well-planned, scalable, and durable electricity policy is vital, particularly one that integrates rural electrification to reduce regional imbalance, mitigate environmental pollution from self-generated power, and ultimately serve as a foundational planning tool for comprehensive national development.

Keywords: Electricity policy, Nigeria, Sustainable development, Urban and regional planning, Power sector reform.

1.0 INTRODUCTION

Electricity is a critical economic infrastructure usually generated through renewable (solar, wind, biomass, water) and non-renewable energy resources (gas, coal, nuclear). It is

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essential for sustainable economic growth and development, as most economic activities depend on affordable and adequate electric energy for effective operation, which is critical for reducing the cost of doing business and enhancing productivity and quality of life. Hence, good electricity policies are fundamental to progress in the economic and social spheres of any country. The formulation of electricity policy is a central function of government, and the quality of the policies, therefore, depends on the capacity of the government to manage policy-making processes. However, there has been no clear understanding of what constitutes this capacity or of what the policy formulation process really looks like. As a result, it has been difficult to know how to enhance it.

1.1 Aim and Objectives

This paper aims to describe the various electricity policies implemented in Nigeria. The specific objectives of the study are to:

- Define the concepts of electricity and policy.
- Identify the various electricity policies in Nigeria.
- Identify their achievements.
- Determine the barriers encountered by the policy.
- Discuss the relevance of electricity policy to urban and regional planning.

1.2 Conceptual Issues

- WHAT IS A POLICY: A policy, according to Wikipedia (2014), is a principle or protocol to guide decisions and achieve rational outcomes, implemented as a procedure or protocol. Policy may also refer to the process of making important organisational decisions, including the identification of different alternatives such as programmes or spending priorities, and choosing among them on the basis of the impact they will have. Policies may be classified in many different ways and are dynamic; they are not just static lists of goals or laws. The Oxford Dictionary (2014) also defines a policy as a course or principle of action adopted or proposed by an organisation or individual. Umar (2010) also defines policy as a deliberate plan of action to guide decisions and achieve rational outcome(s). It could apply to government, private sector organisations and groups, and individuals, including Presidential/Executive orders, corporate guidelines, or legislative rules of order and actions towards achieving a desired outcome.
- CONTENT OF A GOOD POLICY: A good policy will contain the following: a purpose statement, outlining why the policy is being issued and what its desired effect is; an applicability and scope statement, describing who the policy affects and

which actions are impacted by the policy; an effective date, which indicates when the policy comes into force; and a responsibilities section, indicating which parties and organisations are responsible for carrying out individual policy statements. These responsibilities may include identification of management structures and oversight.

- HOW IS POLICY MADE (FORMULATED AND IMPLEMENTED)?

There are two parts to policy formulation:

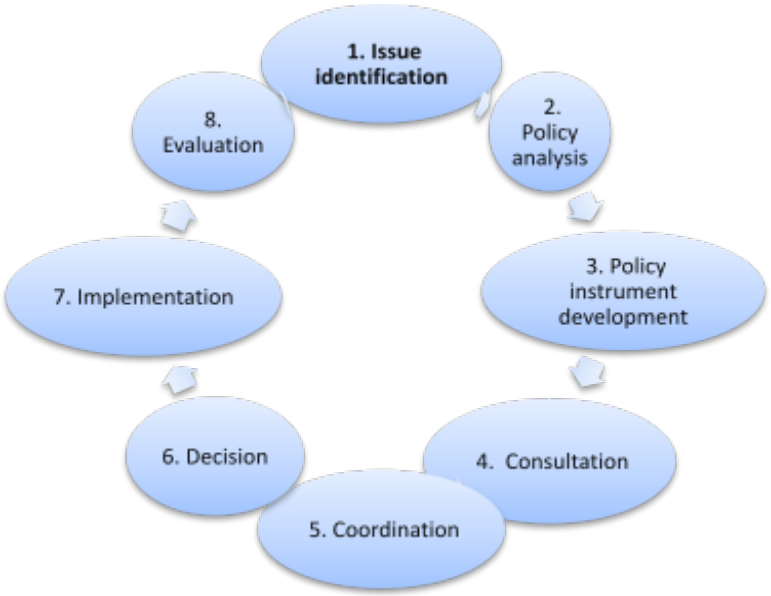
- Effective formulation (analytical phase) means that the proposed policy is regarded as a valid, efficient, and implementable solution to the issue at hand.
- Acceptable formulation (political phase) means that the proposed course of action is likely to be authorised by the legitimate decision-makers, usually through majority-building in a bargaining process. That is, it must be politically feasible.

Policy Implementation: It is difficult to create a conceptual distinction between policy formulation and policy implementation (Dinica, 2004). This is because policy formulation essentially takes place throughout the entire policy process. She opined that the term 'policy-making' should be used for the entire process, 'policy formation' for the initial part of policy-making, and 'policy implementation' for the latter part of the policy-making process. Hence, policy implementation is a process of identifying "what is needed in a way of combining the analytical benefits offered by the 'stages' model with the recognition of the interaction between the stages."

Steps in Policy Formulation and Implementation:

- Deciding whether a new policy or reform is required.
- Promote the new policy or reform an existing one.
- Make the process more participatory by engaging stakeholders.
- Adopt the new policy, which is often merged with the actual implementation stage. Finally, the policy is implemented.
- After implementation, policies must be monitored and evaluated.
- A strategy and an action plan are also required for the policy implementation process.

Policy Cycle:



Source: Althaus et al. (2007).

The Althaus, Bridgman, and Davis model identifies that a policy has a circle around which it revolves. This cycle is represented in the picture above.

Features of Policy Making: There are nine features of modern policy making: the policy must be forward-looking, outward-looking, innovative, flexible and creative, evidence-based, inclusive, joined-up, and regularly reviewed.

- WHAT IS ELECTRICITY POLICY: Electricity policies are official government decisions (legislation or guidelines) that govern how electricity should be generated and transmitted, usually through official written documents or statements of intent. They also encompass broad ideas and goals in political manifestos and pamphlets regarding electricity supply and demand. In spite of the abundant energy resources in the country and the significant government investments in the energy sector over the last ten years, electricity supply remains inadequate and poses a serious challenge to Nigeria's socio-economic development. This paper aims to describe various electricity policies formulated in Nigeria.
- WHY ELECTRICITY POLICY: Electricity policy is formulated in Nigeria for the following reasons: To:
  - Provide a coordinated framework for the implementation of energy policy issues.
  - Develop and maintain a regular inventory of energy resources in Nigeria.

- Ensure continuity and self-sufficiency in energy supply in the short, medium, and long term, at economically favourable costs.
- Protect the quality of the environment and the population from the hazards of energy exploitation and use.
- Improve the nation's technical capabilities in the energy sector for state security, self-reliance, and economic competitiveness.

1.3 Electricity Policy in Nigeria

- PRE-COLONIAL AND COLONIAL ELECTRICITY POLICY

Nigeria is a nation that is especially blessed with energy resources. Electric power generation in Nigeria began in 1896 with hydroelectric power, featuring a 20 MW power station at Ijora, near Lagos. In 1951, the government inaugurated the formation of the Electricity Corporation of Nigeria (ECN) to oversee the electricity sector, and it was established in 1960 to build and manage dams in Nigeria, with a total installed generation capacity of just over 50 MW.

- Post-Independence Electricity Policy

By 1968, Nigeria's total output through the Electric Corporation of Nigeria (ECN) and the complementing Niger Dam Authority (NDA) was 1,600 MW and was considerably ahead of its sub-Saharan African counterparts. In 1972, the Federal Government of Nigeria (FGN) approved the merger of NDA and ECN to form the National Electric Power Authority (NEPA), a vertically integrated (monopoly) power utility responsible for the generation, transmission, distribution, and trading of electricity in Nigeria. The seven power-generating facilities are listed as follows:

- Kainji Dam - Hydro Electric Power Station (760 MW)
- Shiroro Dam - Hydro Electric Power Station (600 MW)
- Jebba Dam - Hydro Electric Power Station (540 MW)
- Egbin Station - Thermal (Steam Turbine) Power Station (1,320 MW)
- Delta Station - Gas Turbine Power Station (913 MW)
- Sapele Station - Gas Turbine Power Station (1,000 MW)
- Afam Station - Gas Turbine Power Station (420 MW)

In spite of its touted capacity, NEPA was never quite able to utilise its full potential and often generated at much lower outputs due in part to climatic unpredictability, a poor maintenance culture, inept technicians, poorly trained engineers, grand theft, pilferage, incompetent management, and a politicised and corrupt administration. Beyond water and

petroleum resources, Nigeria also has abundant reserves of coal, water, natural gas, and lignite that have been abandoned and underutilised for decades (Amadi, 2012). In spite of the huge and diverse energy resources in the country, there are only two major resources that are exploited for electricity generation, namely gas, which contributes about 68%, and water, which generates about 31% of the supply (FGN, 2006). Below is the list of Electricity Policy in Nigeria to date. These enabling policy provisions provided the impetus for the Federal Ministry of Power and Steel to embark on the development of the National Policy Guideline for Renewable Electricity and the Renewable Electricity Action Programme. This document pertains to the National Policy Guidelines on Renewable Electricity.

1999 Constitution of the Federal Republic of Nigeria

The 1999 Constitution of the Federal Republic of Nigeria places electricity generation, transmission, and distribution on the Concurrent Legislative List. This allows all tiers of government to be involved in most aspects of the electricity supply industry.

National Economic Empowerment and Development Strategy

The National Economic Empowerment and Development Strategy (NEEDS), Chapter 5, proposes a set of targets to be met by the power sector before 2007, among which are:

- Increase generation capacity from 4,200 MW to 10,000 MW (a 138% increase)
- Increase transmission capacity from 5,838 MVA to 9,340 MVA (a 60% increase)
- Increase distribution capacity from 8,425 MVA to 15,165 MVA (80% increase)
- Reduce transmission and distribution losses from 45% to 15%.

National energy policy

In the Policy Overview of the National Energy Policy (NEP) of August 2003, the overall thrust of the energy policy is stated as “optimal utilisation of the nation’s energy resources for sustainable development.” The following are the relevant provisions of the NEP for the development of the Policy Guideline for all sources of energy.

Policies

- The nation shall fully harness the hydropower potential available in the country for electricity generation, paying particular attention to the development of mini and micro hydropower schemes. The exploitation of hydropower resources shall be conducted in an environmentally friendly manner, and private sector and indigenous participation in hydropower development shall be actively promoted.

- The nation shall aggressively pursue the integration of solar energy into the energy mix, and the nation shall keep abreast of worldwide developments in solar energy technology.
- The nation shall effectively harness non-fuel wood biomass energy resources and integrate them with other energy resources, and the nation shall promote the use of efficient biomass conversion technologies.
- The nation shall commercially develop its wind energy resources and integrate these with other energy resources into a balanced energy mix. The nation shall take necessary measures to ensure that this form of energy is harnessed at sustainable costs to both suppliers and consumers in rural areas.

Furthermore, the national policy guidelines aim to provide a coordinated framework for the implementation of energy policy issues. To this end, the Energy Commission of Nigeria was set up, in addition to the government-funded centres for energy research at Ahmadu Bello University, Zaria, the University of Nigeria, Nsukka, and Obafemi Awolowo University, Ile-Ife.

National Electric Power Policy and Electric Power Sector Reform Act

The National Electric Power Policy (NEPP) of 2001 was the precursor to the Electric Power Sector Reform (EPSR) Act of 2005. Indeed, most of the significant provisions of the NEPP are included in the EPSR.

The Electric Power Sector Reform (EPSR) Act 2005 emphasises the role of renewable electricity in the overall energy mix, especially for expanding access to rural and remote areas. In Part IX, under Rural Electrification, Section 88(9) stipulates that information shall be presented to the President by the Minister of Power and Steel on, among others:

(a) expansion of the main grid

(b) development of isolated and mini-grid systems, and

(c) renewable energy power generation

Renewable Electricity Promotion and Regulatory Policies (2006)

In growing the market for renewable electricity in Nigeria, the Federal Government has established the following policies and regulatory measures:

Policy 1: The Federal Government of Nigeria shall expand the market for renewable electricity to at least five per cent of total electricity generating capacity and a minimum of 5 TWh of electric power production, excluding large hydropower, by 2016.

Policy 2: The Federal Government shall establish stable and long-term favourable pricing mechanisms and ensure unhindered access to the grid. Grid operators must guarantee the purchase and transmission of all available electricity from renewable electricity producers. While renewable electricity plant owners bear the cost of connection, grid operators must ensure the necessary system upgrades. All upgrade costs must be declared to ensure the necessary transparency.

Policy 3: The Federal Government supports the construction of independent renewable electricity systems in areas not covered by the electricity grid to provide power services for local economic activities and sustainable living.

Policy 4: The Federal Government will develop innovative, cost-effective, and practical measures to accelerate access to electricity services in rural areas through renewable sources.

Policy 5: A Renewable Electricity Trust Fund shall be established under the Rural Electrification Fund.

Along this line, the National Electric Power Authority (NEPA) in January 2004 commenced its internal unbundling process by creating 11 semi-autonomous business units from its former distribution sector to facilitate the eventual corporatisation of the business units upon the enactment of the EPSR bill to achieve the government's ultimate goal of divesting its interest in the Generation Companies (GENCOs) and Distribution Companies (Discos), while the Transmission Company (Transysco) was to remain state-owned and the others privatised. With the bill's enactment into law, an independent Electricity Regulatory Commission (NERC) was created. The Electric Power Sector Reform Act of 2005 was enacted for the formation and review of electricity tariffs, transparent policies regarding subsidies, promotion of policies that are efficient and environmentally friendly, and also for the formation and enforcement of standards in the creation and use of electricity in Nigeria. Prior to the enactment of EPSR, the Federal Government of Nigeria (FGN) was solely responsible for the formulation of policy, regulation, operation, and investment in the Nigerian power sector. Regulation was conducted through the Federal Ministry of Power, with operations through the National Electric Power Authority (NEPA), a wholly owned state-owned enterprise responsible for power generation, transmission, and distribution.

The Electric Power Sector Reform Act of 2005 established NERC's authority to impose mandatory reliability standards on the transmission system and to impose penalties on companies that manipulate the electricity markets (NIPP, 2013). In October 2005, NERC commenced operations with its headquarters in Abuja, Nigeria. NERC developed and passed various regulations in its efforts to provide direction to industry operators and prepare the ground rules for public/private sector participation. These regulations can be categorised into commercial, technical, legal, and customer-related. The reforms focused on the development of a wholesale electricity market through the segmentation and licensing of each of the Power Holding Company of Nigeria (PHCN) Successor Companies (which are now CAC-registered entities), now including IBEDC (Ibadan Electricity Distribution Company). The reforms also provided for the establishment of a Power Consumer Assistance Fund and the establishment of the Rural Electrification Agency (REA) to create and manage the Rural Electrification Fund. These efforts are targeted at opening up the power sector for private sector participation. At present, nearly 40 private entities have been licensed by the commission to generate more than 12,000 MW, and many are already operational, with the nation having an installed generating capacity of 9,000 MW (FGN & NIPPs). The available useful capacity is about 4,500 MW (as of October 2011).

Before the year 2009, the plan gave birth to the development of a five-year strategic plan derived from the objectives set out in the EPSR Act (2005). Successive administrations had consistently neglected to develop any meaningful national policy on energy and power. However, in 2009, Nigeria's Vision 20:2020 policy on electricity incorporated the five-year plan, formulated to generate, transmit and distribute 35,000 MW by the year 2020. The policy plan is divided into three: long-term plan, short-term plan and middle-term plan. The policy thrust of the short-term goal was to generate, transmit and distribute 8,000 MW by 2010, while the policy thrust of the middle-term goal is to generate, transmit and distribute 16,000 MW of electricity by 2013 through the private sector, in order to create a competitive electric power sector that attracts foreign and local investments. The overall long-term goal is to increase electricity generation, transmission and distribution from a capacity of 3,700 MW as of December 2009 to 8,000 MW by 2010, 16,000 MW by 2013, and ultimately 35,000 MW by 2020. Access to electricity is expected to increase from the current 40% to 50%, while per capita consumption will rise from the current 125 kWh to 500 kWh over the plan period. This is expected to be achieved through significant investment in rural electrification programmes, harnessing alternative energy

technology from coal, gas, nuclear and other renewable energy sources such as solar, wind and biomass. Its strategic objective is to ensure that the sector can efficiently deliver sustainable, adequate, reliable and affordable power in a deregulated market, driven by the private sector, to reduce electrical wastage, encourage local production of inputs required for developing the sector, and improve the billing system. In this policy, the government will invest in direct electricity generation as well as provide an appropriate legal and regulatory environment for private sector participation. Presently, the Presidential Action Committee on Power (PACP), which is chaired by the President and includes the Vice-President and Ministers, has been formed to ensure a symbiotic relationship between the managers responsible for implementing various aspects of sector reforms and privatisation, evident in the concessioning of Kainji, Jebba and Shiroro Hydro Power Stations.

2.1 The Achievements of the Policy

- Development of a five-year strategic plan derived from the objectives set out in the EPSR Act (2005). Activities are tailored towards four main goals: uninterrupted electricity supply, private sector participation, consumer protection, and fair regulation.
- Licensing of 40 independent power producers (IPPs) with an expected power injection of about 12,000 MW into the National Grid. Nine of the IPPs are currently in operation.
- Licensing of the successor generation, transmission and distribution companies and the NIPP
- Development of technical codes, standards and regulations to ensure safety, reliability and quality in electricity supply.
- Monitoring the progress of licensed IPPs and launching the industry health and safety manual
- Train-the-trainer workshops on the health and safety manual for industry operators are organised in different parts of the country.

2.2 Barriers to the Policy

1. 1. Policy and regulatory barriers
2. 2. Financing and investment barriers
3. 3. Technological Barrier
4. 4. Poor public awareness
5. 5. Standards and Quality Control
6. 6. Offtake problems
7. 7. Grid Instability
8. 8. Lack of Incentives

1.0 Relevance of Electricity Policy to Planning

Since electricity consumption is positively related to economic growth, it means that electricity consumption has diverse impacts on a range of socio-economic activities and consequently the living standards of Nigerians. This shows that a well-planned electricity policy would directly and indirectly have implications for planning. This relationship and relevance are seen in the following strategies:

- Ensure a clean development mechanism in electricity policy to reduce local air pollution from natural gas and tackle greenhouse gas emissions through the full exploitation and promotion of renewable energy resources in an environmentally friendly manner.
- Security, climate change, and public health issues should be well represented in the policy. The appropriate location of energy transmission network facilities (transformers, electric poles) should be emphasised in the policy, along with the issue of setbacks to facilities.
- The restricted privatisation policy for logistic and economic reasons will not make rural areas that are remote from the grid attractive to private power investors, and this might leave these areas unserved for the foreseeable future. Hence, there should be equality in the policy formulation and implementation between rural and urban areas of the country.
- Policy should reduce the energy imbalance between regions in Nigeria.
- Reduction in self-generated electricity to decrease air and noise pollution from generating sets.
- Energy policy shouldn’t be centred on urban centres; rural areas' energy demand and supply should also reach centre stage in order to reduce deforestation,

emissions of greenhouse gases, and pollution caused by dependence on fuel wood and biomass.

3.0 Conclusion

The Energy and Power quest in Nigeria was never quite an accomplished objective. Neither could it have been considered remotely finished or adequate with regard to available demand. Rather, it was a process in development, one that could reasonably be considered to be well on its way to notable success if the earlier trend had continued. The present administration is desirous of leaving behind a commitment to a policy of integrated rural development as a key to national development. Basic to this is the provision of electric power in rural areas, an objective which the Rural Electrification Programme is designed to achieve. The faithful implementation of the goals of the National Energy and Power Policy is a building block process that will actually give wings to the underlying objectives that are being voiced. The real work and the fundamental role of government is to understand the long-term needs of its constituency and thus create and implement a useful policy by due process, one that is workable, viable and feasible; one that is scalable, durable and accomplishes the overall agenda, depending on the government.

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