

Restructuring the Electrical Power Sector for Sustainable Development

Airoboman A.E., Ibhaze A.E., Amaize P.A.
 Department of Electrical and Information Engineering
 Covenant University, Ota, Nigeria
 abel.airoboman@covenantuniversity.edu.ng
 ehiremen.ibhaze@covenantuniversity.edu.ng
 peter.amaize@covenantuniversity.edu.ng

Ignatius Kema Okakwu
 Department of Electrical and Electronics Engineering
 University of Benin, Benin City, Nigeria
 Email: igokakwu@yahoo.com

Abstract - The globalization of the market place, industrialization and national wealth of any sovereign state can be attributed to seamless and efficient power supply. Using Nigeria as a case study in Africa, with a seemingly large population and a potentially large market, with an undeniably decayed electrical power infrastructure, this paper, therefore, identifies a fundamental factor underlying the challenged electrical power sector using spreadsheet analysis. The findings emphasize good governance and techno-political innovations as the proper remediation in revamping the infrastructure which will engender uninterrupted power supply for sustainable development

Key word: Power sector, Globalization, Industrialization, Governance, Sustainable development.

I. INTRODUCTION

Engineering experts are liable by virtue of enacted code of conduct, good governance, and expertise to place the well-being of the public first in the cause of carrying out their engineering duties. Engineering failure usually lead to loss of huge resources and attract national and media interest. Failure of complex engineering systems is often described as a national disaster which can be prevented hence appointing competent individuals with the appropriate expertise to man the Engineering sectors.

Engineers in Nigeria have almost kept mute about the planned action driving some of the most relevant ideas aimed at maintaining a sustainable environment due to the political crack-down over the years. Instead, to their recognition, policy makers and administrators have been at the forefront in identifying solutions to be employed in mitigating difficulties encountered in engineering practice even when Science Technology Innovation (STI) is the midway to curbing such problems. The effect of this is poor management of infrastructure as presently been observed in the electric power sector. Good governance requires that government should support engineering professionals in all areas in running the electrical market with emphasis not on politics and quota system but on the expertise that is embedded in professionals. A complete depoliticizes and de-quotalise electricity market

system to harness best result possible [7]. The Nigerian engineers are among the best in the world, but due to politics of appointing a political figure as the head of the parastatals, they generally lose interest in the system [2]. If a good number of engineers were to be among the lawmakers in Nigeria today, then STI would have been maximized greatly thereby leading to a corresponding improvement in the well-being of the masses[4]. As a matter of fact, power unavailability has become a veritable avenue to gaining more votes during elections. This is just because if a politician can easily tackle the issue of unavailability of electricity supply, then, such is considered a national hero [1].

Some persons may argue that the permanent secretary in a technical ministry is one who must be technically sound hence, the minister he/she is reporting to need not to be technically sound but should be one who is vast in policy making and administration. If a policymaker by the virtue of the former is not technically grounded with the activities of the ministry then in an actual sense how will he/she know how public policy and technology in the sector interact? The resultant effect of this according to [3] is that their decisions are taken based on the second-hand input which may not necessarily be in the public's interest and practices. The swift containment of ebola spread in the country in 2014 with the minister for Health being a trained medical expert [5] is a clear indication of having trained practitioners lead core professional commissions, parastatals, agencies and ministries in the country. A fundamental driver arising from the de-democratization of the country via unrequired military evasion of governance in Nigeria has created a succession of ministerial appointment based on trust, sector's, past administrative merits and the financial base of the sector rather than competence.

This has plunged many professional ministries with the power sector inclusive into a state of dilemma.

According to the Nigerian Society of Engineer Memorandum and article of Association Article 80(j) *"It shall be considered unprofessional and inconsistency with honorable and dignified and contrary to the public interest*

for any member to undertake work he is not competent to perform by virtue of his training and experience”[8]. Although most of the policy makers who at one time or the other have served as ministers of power are non-members of the society but the fact remains that they might have taken up responsibilities in areas they are not competent on by virtue of their training and this may not also be interest of the welfare of the public.

Table 1: Generation Capacity of Electricity in Nigeria [7].

Year	Total Generation Capacity (GWH)	Average Generation Capacity (MW)	Per Capital Consumption (kW)
1999	16,089	1837	0.151
2000	14,727	1681	0.134
2001	15,463	1765	0.138
2002	21,54	2459	0.178
2003	20,183	2304	0.172
2004	24,275	2771	0.201
2005	23,539	2687	0.187
2006	23,110	2368	0.178
2007	22,978	2623	0.177
2008	21,110	2638	0.178
2009	18,817	2148	0.139
2010	24,872	2839	0.179
2011	23,652	2700	0.167
2012 (Oct.)	-	4100	-

Table 2: Minister for Health from 1999-2015

Year	Portfolio	Discipline
1999-2001	Minister for Health	Medicine & Surgery
2001-2003	Minister for Health	Parasitology
2003-2007	Minister for Health	Economics
2007-2008	Minister for Health	Medicine & Surgery
2008-2010	Minister for Health	Medicine & Surgery
2011-2015	Minister for Health	Medicine & Surgery
2015-date	Minister for Health	Medicine & Surgery

Table 3: Minister of Justice from 1999-2015

Year	Portfolio	Discipline
1999-2000	Minister of Justice	Law
2000-2002	Minister of Justice	Law
2002-2003	Minister of Justice	Law
2003-2005	Minister of Justice	Law
2005-2007	Minister of Justice	Law
2007-2010	Minister of Justice	Law
2010	Minister of Justice	Law
2010-2015	Minister of Justice	Law
2015-date	Minister of Justice	Law

Table 4: Minister of Power from 1999-2015

Year	Portfolio	Discipline
1999-2000	Minister of Power	Law
2000-2003	Minister of Power	Geology
2003-2007	Minister of Power	Law
2007-2008	Minister of State for Power	French
2008-2010	Minister of Power	Ph.d Energy Economics
2010-2011	Minister of Power	Zoology
2011-2012	Minister of Power	Ph.d (Industrial Engineering)
2012-2015	Minister of Power	Ph.d Materials Engineering)
2015-date	Minister of Power	Law

Table 5: Amount released to the sector 1999-2015 [6]

Year	Amount Appropriated(₦)	Amount Released(₦)
1999	11,206,000,000	6,698,000,000
2000	59,064,000,000	497,850,000.00
2001	103,397,000,000	70,927,000,000
2002	54,647,000,000	41,196,000,000
2003	55,583,000,000	5,207,000,000
2004	54,647,000,000	54,647,000,000
2005	90,283,000,000	71,889,000,000
2006	74,308,000,000	74,300,000,000
2007	100,000,000,000	99,800,000,000
2008	156,000,000,000	112,000,000,000
2009	89,500,000,000	87,000,000,000
2010	172,000,000,000	70,000,000,000
2011	125,000,000,000	61,000,000,000
2012	1,979,000,000	55,300,000,000
2013	146,000,000,000	49,000,000,000
2014	69,800,000,000	48,000,000,000
2015	5,240,000,000	-
Total	1,368,654,000,000	907,461,850,000

II. METHODOLOGY

The data collated was analyzed sequentially using simple percentages and the result interpreted graphically with the aid of spreadsheet.

$$\frac{x}{100} \times a = b_i \quad (1)$$

$a = \text{Total number of years covered}$

$b_i = 0 \leq i \leq 3$

When $i = 0 \rightarrow \text{Electrical Engineers}$

When $i = 1 \rightarrow \text{Non-Engineers}$

When $i = 2 \rightarrow \text{Engineers in Related Field}$

When $i = 3 \rightarrow \text{Non-Engineers but possess degree relevant in the power sector.}$

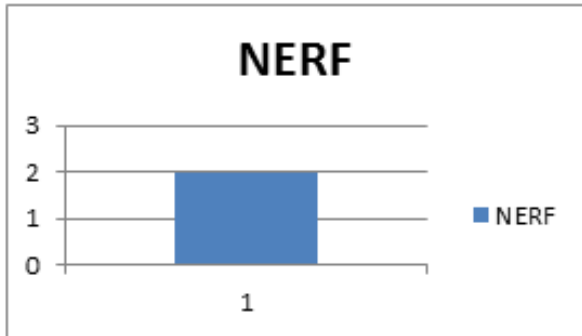


Fig. 1: Graph of NERF Vs No of Years

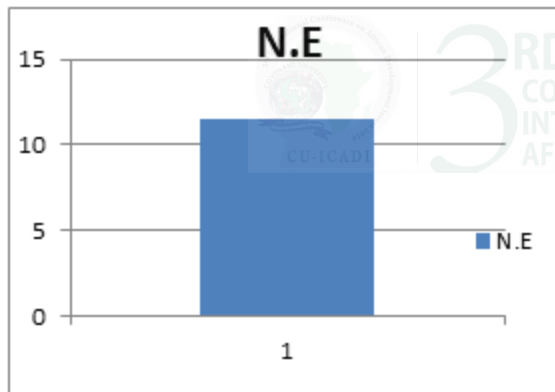


Fig. 2: NE Vs No of Years

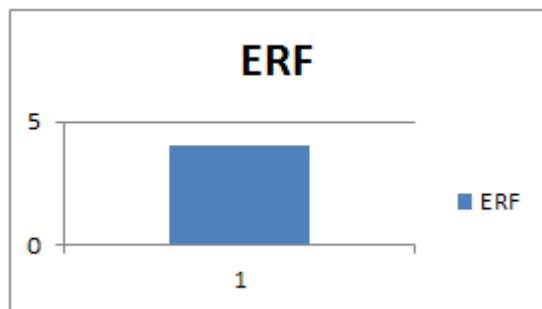


Fig. 3: ERF Vs No of Years

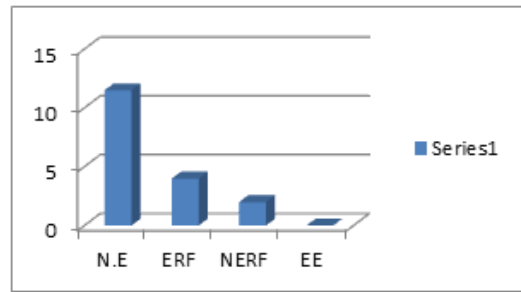


Fig 4: NE, ERF, NERF, EE Vs No of Years



Fig 5: Discipline of Ministers of Justice Vs No of Years

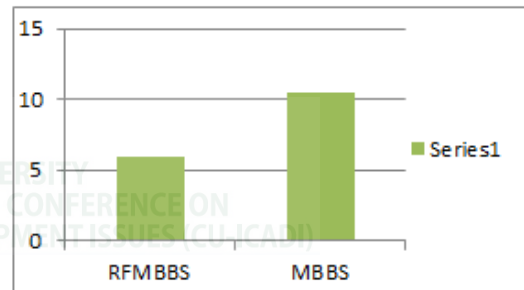


Fig 6: Discipline of Ministers of Health Vs No of Years

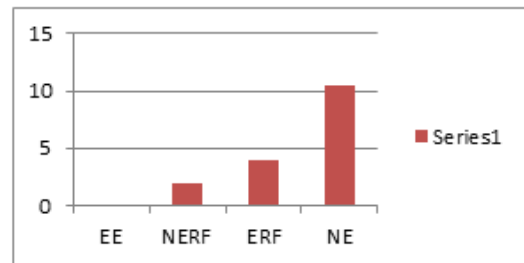


Fig 7: Discipline of Ministers of Power Vs No of Years

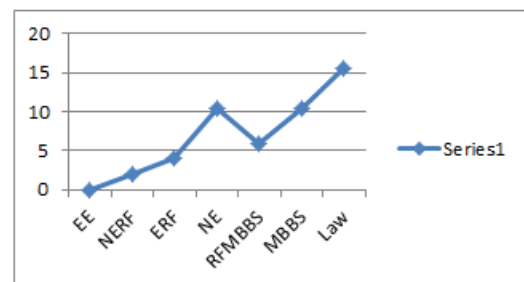


Fig 8: Discipline of Ministers in Professional Ministry Vs No of Years

Table 6 Legend definition

EE	Electrical Engineers
ERF	Engineers in related field
MBBS	Medicine and Surgery
NE	Non-Engineers
NERF	NonEngineers but in related field
RFMBBS	Related Field in Medicine and Surgery

III. DISCUSSION OF RESULTS

From table 1 it is apparent that since the advent of the fourth republic in Nigeria, the average generation capacity is still within 4000MW, Table 5 has also shown the amount that has been appropriated and released to the sector during this period, comparing the generation capacity with the funds appropriated to the sector, it is apparent that funds have been either misappropriated or mismanaged which can be attributed to poor governance. Fig 1-4 has shown that for the past 16 years majority of the ministers of power appointed are non-engineers and these non-engineers have been in charge of the ministry at a percentage of 63.6%, while engineers who possess degree in field related to the power sector have been in charge of the sector at a percentage of 24.2%, non-engineers but who by virtue of a higher qualification possess a degree relevant to the power sector have been in charge for a record of 12.2% while an electrical engineer is yet to be appointed as minister of power.

IV. CONCLUSION

If electrical energy is truly the mainstay of any economy and if appointing non-engineers to head the ministry has done more harm than good, then it is of utmost importance that qualified and registered electrical engineers be appointed to man the power sector henceforth. An electrical engineer has never been favored either by politics, performance or professional competence to be appointed either as the minister of justice or minister for health. Then such favoritism should not be granted to non-engineers for the purpose of manning the sector irrespective of personal interest. The result based on existing records has shown mismanagement at all arms of the sector viz-a-viz poor generation, poor technical know-how, lack of sustainable policy, poor maintenance and maintenance strategy, the poor welfare of staff to mention but few. If the present generation capacity (4000MW) is divided by the total population in Nigeria (160million) then, a citizen of the country may only get 25W supply power daily which cannot power a regular 60W incandescent bulb it, therefore, implies that the ministers that have been saddled with the affairs to run the sector have from inception have succeeded in providing electric power which cannot power a 60W electric bulb, an indication that they do not know how policy and technology interact.

V. RECOMMENDATIONS

1. The modalities for selection of professionals to head the power ministry should be in consonance with what is obtainable in other professional bodies like the Health and Justice ministries such as

- Qualified and competent electrical engineers

- Engineers who possess qualifications related and relevant to the power sector or
- Engineers who by virtue of a doctorate degree have made themselves an authority in the field should henceforth be appointed ministers of power.

2. Sound management decision based on technical competence is also required when appointing ministers of power
3. Restructuring the power sector with emphasis not only on the technicality of the sector but in the welfare of the staff is required.
4. The power sector in Nigeria is still in its developmental stage with respect to its generation capacity hence, the appropriate authority should incorporate more qualified engineers into the system in order to attain sustainable development.
5. The Federal government should henceforth desist from appointing lawyers, geologist and others who are not grounded in an engineering discipline as ministers of power.
6. Henceforth, public policy should be enacted by electrical engineers such that more professional voices are heard when making key professional decisions.

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