American International Journal of Business Management (AIJBM)
ISSN- 2379-106X, www.aijbm.com Volume 2, Issue 2 (February - 2019), PP 09-15

Effect of Energy Sustainability on the Performance of Deposit Money Banks: Perception of the Managers

[1]Adebambo Hameed Olusegun;[2]Ogunjobi Victoria, Oluwatunbi
[1,2]Department of Project Management Technology, School of Management Technology
The Federal University of Technology Akure, Nigeria

ABSTRACT:-Energy usage has become an important concern in the past years due to its growth, awareness and increase in taking the personal responsibilities in preventing climate change. However, the overall energy inefficiency system and environmental problems caused by the manner in which it is sourced, produced and used has become a key challenge to global economic development. Hence, sustaining energy efficiency is an important approach in financial institutions as energy consumption has persistently been on an increasing verge. This study examines the effect of sustainable energy consumption on the of deposit money banks in Lagos, Nigeria. A well-structured questionnaire was used as basis for investigating a representative sample of 77 respondents who areoperational managers of deposit money banks in Lagos, Nigeria. Partial least square structural equation modeling (PLS-SEM) was used to test the effect of energy sustainability on the financial and operational performance of deposit money banks. This study found a significant effect of energy sustainability on financial and operational performance. Thus, it is concluded that energy sustainability is an important factor for financial and operational performance. The study therefore recommends that adoption of environmental technologies, energy efficiency education and investment in sustainable energy/ green facilities be encouraged among deposit money banks to better reap the benefits of sustainable energy consumption.

Index Terms: - Sustainability, energy sustainability, financial performance, operational performance**.**

I. INTRODUCTION

Sustaining energy efficiency is an important approach in financial institutions as energy consumption has persistently been on an increasing verge ([1]. Therefore, the need to establish initiatives that see into energy consumption, extent of energy usage, security, energy provision as well as the determination of energy effects on operations of financial institutions is important (World Bank, 2010). As a result of this, the actual energy uses after office hours along with monitoring of the energy rates of electrical machines used by banks needs to be measured in order to achieve a significant saving in energy consumed by banks [2].

Banks have adopted several measures such as educating its staffs on energy efficiency issues such as developing a greener mainstream banking philosophy, installation and environmental technologies, full transparency and complete reporting and disclosure on energy use issues to the management which are important to energy sustainability [3]. Alternatively, banks have also contributed to environmental financing such as offering energy efficient mortgages and loans to clients to upgrade their system to a fundamental green financial tools and systems. For example, a sum of $ USD 62 billion was spent by the Bank of America to finance low-carbon and sustainable business activities. Also in 2012, about $USD 125 billion was provided by the same bank as their second commitment to foster a significant development solution to climate change [4].

In Nigeria, deposit money banks (DMBs) seem to have recently awakened to the opportunities of energy conservation after getting their fingers burnt in the past years. Over the last years, about NGN5Trillion was seen to have been committed to energy restoration by the banking sector [5]. According to the report of Urhobo Today [6], about N18.78 billion was spent by five banks in 2016 on fuel and maintenance of power supply and this expenses has affected the financial performance by declining the income of the banks. While some banks with a smaller branch network spent close to N400 million on fuel and maintenance costs, bigger banks with larger branch networks were the worst hit as they had to spend more on diesel and servicing of their power generators. It was further reported that about N10.36 billion was spent on fuel and generator maintenance by one of the top tier bank in 2015 while another bank spent about N5.78 billion running its operation on power generation in 2016 [6].

Banks in Nigeria have continued to post lower profits as evidenced in the six-month bank reports of the first half of year 2016 which shows a growing cost of operation, alongside an increasing non-performing loan in the banking industry. Specifically, a 14% decline in profit of eight banks from N129.73 billion to N111.13 billion was recorded in the first half of 2015. Even though the result of the profit of the banking industry in 2015 had already shown a decline in the financial performance, there is every indication that the situation might get worse as a lower profit was predicted by financial analysts at the 2016 financial year end.

From the above financial reports, it is obvious that the Nigerian deposit money banks have been carrying a dead weight of the cost required to maintain a large branch network across the country. While a high capital

investment is needed to sustain energy consumption in deposit money banks, the associated cost of maintenance of the sustainable energy in the long run of the alternative power supply in the banking industry is marginal and economically viable in developing nations, especially Nigeria. In light of these views, it is important to assess the level of energy sustainability and its effect on the performance of the Nigerian Deposit Money Banks.

II. LITERATURE REVIEW

Due to huge expenses on energy in the Nigerian banking sector, many deposit money banks (DMBs) in Nigeria have now turned to a renewable source of energy in an attempt to cut the rising cost of running their branches across the country. While the implementation of solar panel has been at a pilot stage in some bank branches in Nigeria, the use of inverters as an alternative source of power has been perfected by the others in running their Automated Teller Machines (ATM) across the country. Uninterrupted Power Supply (UPS) devices are also being utilized by some of the banks in some of their operations without reverting to power generating plants. Pilot schemes on solar plans have been launched by many Nigerian banks like Sterling Bank as an alternative source of electrical supply. Similarly, Fidelity Bank has also reverted to adopting Uninterrupted Power Supply (UPS) devices and inverters to power its ATMs and major banking operations after they were reported to have spent over N372 million on power generation in 2015. Hence, the measure aimed by banks at cutting operations costs has become even more popular among other banks.

Sustainable energy consumption and energy efficiency have been used interchangeably in literatures [7]. Whilst sustainable energy consumption indicates the ability of firms to consume its energy in such a manner that will not jeopardize the need energy consumption of future generation, energy efficiency reveals the ability of firms to use and allocate energy input efficiently in the operations of firms to achieve competitiveness through reduced energy consumption, costs and carbon emission [8].

Previous literatures on energy sustainability have ascertained the tendency of firms to achieve better performance through a sustainable consumption of energy in their operational activities [8, 9] as sustainable and efficient consumption of energy are most widely recognized as cost approach used by firms to stay ahead of competition in the industry.

Several studies have identified the relationship between sustainable energy consumption and performance in firms[10]. For example, Zhang [8] on energy efficiency and firm performance in the Swedish industry identified a positive relationship between energy efficiency and firm performance and hence, concluded that any firm that strategizes on sustaining its energy is likely to save costs and further improves its productivity. This indicates that firms stand to achieve better financial and operational performance in a situation where its energy consumption is sustainable.

Similar assertion was made in the study of [9] which collected secondary data from World Bank survey to investigate the relationship between firm profitability and energy efficiency complemented the relationship between energy sustainability and profitability which stated that if increase in energy efficiency tends to have positive effect on firm's profitability, then switching to a more energy saving technologies could be more feasible on the performance of firms even in the presence of large adoption costs. Furthermore, [11] has identified through analysis of variance (ANOVA) the effect of changing operating policies on energy use of manufacturing firms that a relationship exists between energy use and operation strategy of firms. The study revealed that optimizing the operations strategies of firms can potentially result in a major cost saving, hence better financial performance of firms.

According to the findings of the [7] on the effectsof energy consumption on financial performance of firms, sustainable energy has a tendency to lower the cost of utility, increase sales price and lower construction cost premiums on projects. Hence, it could be deduced that energy efficiency can be used by firms to achieve better financial performance.

However, while many previous studies have identified a positive effect of sustaining energy on firm performance [7, 8, 9 11, 13, 19] has identified a mixed relationship between sustainable energy consumption and performance of firms by concluding that relationship between sustainable energy consumption and firm performance might not be significant in a situation where the consumers of the sustainable activities are not aware of the sustainable activities going on in their firms.

However, in relation to the banking industry, literatures have revealed that sustainable consumption of energy has the ability to improve the financial and operational performance of banks. The study of [14] using 494 US facilities of PNC banks on the relationship between corporate sustainability and firm financial performance revealed that banking facilities that embarked on sustainable energy consumption was able to improve its financial performance by saving a cost of $675.26 per employee in utility costs compared to firms without sustainable/green facilities. In addition, the study found that through sustainable consumption of energy, banking operations has increased in term of deposit customer and loan accounts.

Having discussed that energy sustainability has the possibilities to positively influence the performance of firms. In banking operations, sustainable consumption of energy may be motivated in banks when banks use alternative source of energy supply which reduces energy costs that may result in a financial cost saving to the banks by offsetting any additional costs of running on the unsustainable consumption of energy.This study is of the opinion that deposit money banks stand to achieve a better financial and operational performance in a situation where its energy consumption is sustainable.

III. METHODOLOGY

This research adopted a quantitative research approach conducted in a cross-sectional design to analyze the effect of energy sustainability on the performance of deposit money banks in Lagos, Nigeria.The study was conducted in Lagos metropolis due to its high concentration of banks which makes it the commercial hub for trading and centre of excellence in Nigeria. The total population of the study is 123 banks, which consist of the facility manager, unit manager and bank operational manager of the selected banks. These respondents were selected for the study because of their involvement and understanding of energy consumption of their banks.The study selected a sample size of 97 from the target population using the simplified statistical sample table by [15]. The sample was selected from this population by using a simple random sampling method.

Survey questionnaire which was self-administered to the selected sample was used for data collection. The choice of this data collection technique is informed by its ability to provide an efficient use of the time, energy and costs of the researcher [16]. Items of the questionnaire used were adapted from past studies on energy efficiency and performance and were measured on a 5-point Likert type scale of 1- 5.

A total of 97 survey questionnaire was distributed to the respondents and 77 usable questionnaires was returned and used for the data analysis. This represents a 79.38% response rate. Data analysis was done by using the smartPLS 2.0 M3 [17] path modeling software. PLS-SEM offers several advantages such as emphasizing minimum requirement on sample size to achieve G-power for the analysis.Hence, this study used PLS analysis technique to assess the measurement and the structural model in this study.

IV. FINDINGS

A. Demographics of the Respondents

The result of the demographic analysis of the study shows that 35.1% of the respondents have less than 5 years' working experience, 35.1% of the respondent have between 5-9 years' work experience, 22.1% of the respondents have 10-14 years' work experience, 5.2% of the respondents have between 15-19 years' work experience and 2.6% of the respondents have over 20 years work experience. A total of 65.1% represents respondents with between 5-20 years' experience in deposit money banks: Thus, it is noted that a large proportion of the respondents haveacceptable years of experience of energy consumption in the NigerianDMBs.

B. Sources of Energy in Nigerian deposit Money banks

The descriptive analysis result of this study for the sources of sustainable energy as shown in Table 1 reveals a high use of generating plant(46.8%, mean value = 4.19) as the source of energy in the deposit money banks in Nigeria. This is followed by the use of power inverter (32.8%, mean value = 3.68) which is ranked as the 2nd source of energy. The third ranked source of energy by the respondents is the use of uninterrupted power supply (UPS) (33.8%, mean value = 3.65)ranked 3rd. The solar system is ranked as the 4th source of energy (7.8%, mean value = 1.85), while the wind power is the 5th ranked (5.2%, mean value = 1.55) source of energy in the Nigerian deposit money banks.Further Chi-test was conducted for the goodness of fit to indicate if any of the responses was significantly selected more than the other and the findings revealed a significant number (182, 46.8%) which indicates that generating power is the most prevalent source of alternative in the Nigerian deposit money banks.

Table 1:Sources of Energy

Description	Mean	Std. Dev	Rank
Generating Plant	4.19	.960	1st
Power Inverter	3.68	1.234	2nd
Uninterrupted Power Supply(UPS)	3.65	1.313	3rd
Solar System	1.83	1.267	4th
Wind Power	1.55	1.086	5th

C. Level of energy sustainability in Nigerian Deposit Money Banks

The descriptive analysis result in assessing the level of energy sustainability in the Nigerian DMBsas shown in Table 2 revealed that: there is a medium level of 'transparency on energy use by the employees' ($M = 3.44$, $SD = 1.174$), $t(77) = 11.679$, $p < 0.005$: a medium level of report on energy use ($M = 3.40$, $SD = 1.211$), $t(77) = 15.941$, $p < 0.005$; medium level of energy efficiency education ($M = 3.26$, $SD = 1283$), $t(77) = 13.583$, $p < 0.005$; low level of adoption of environmental technology ($M = 2.93$, $SD = 1.295$), $t(77) = 18.218$, $p < 0.005$; low level of greener mainstream banking philosophy ($M = 2.90$, $SD = 1.314$), $t(77) = 17.977$, $P < 0.005$. Hence, the finding shows that sustainable energy consumption in the Nigerian deposit money banks is still low.

Table 2:Relative importance index of energy sustainability

Description	Min	Max	Mean	Std. Deviation
Energy efficiency education	1	5	3.26	1.283
Greener mainstream banking philosophy (Renewable energy sources)	1	5	2.90	1.314
Adoption of environmental technologies	1	5	2.93	1.295
Transparency on energy use by the employees	1	5	3.44	1.174
Report on energy use by the employees	1	5	3.40	1.241

D. Assessment of measurement model: Item Loadings, Average Variance Extracted and Composite Reliability

The measurement model was assessed through the convergent validity which indicates the degree to which several items measuring a certain concept agreed. The loadings, average variance extracted (AVE), and the composite reliability (CR) was assessed for the achievement of convergent validity.The result of the statistical analysis as shown in Table 3 indicates a good item loading above the threshold of 0.4 recommended [18].In term of the internal consistency of the items, the findings revealed a composite reliability value of 0.915 for financial performance, 0.908 for operational performance and 0.884 for energy sustainability. These composite reliability values are above the threshold value 0.7 suggested by Hair et al. [18] indicating a good internal consistency of the constructs.In addition, the results of AVE, which indicates the amount of the extracted variance by the latent constructs revealed values revealed AVE value of 0.686, 0.664 and 0.605 for financial performance, operational performance and energy sustainability respectively which are greater than the recommended threshold of 0.5 [18]. Hence, the findings show that the values of items loading, composite reliability and the AVE all exceeded the threshold values and therefore indicate the achievement of convergent validity.

Table 3:The Convergent Validity: loading, AVE and composite reliability

	Items	Loadings	AVE	CR
Financial Performance	Increase in return on investment (ROI)	0.654	0.686	0.915
	Increase in profit margin	0.854		
	Increase in cash flow	0.860		
	Increase in turnover rate	0.876		
	Increase in market share	0.876		
	Improvement in service quality	0.763	0.664	0.908
Operational Performance	Lead time reduction	0.823		
	Improvement in after office services/ ATM services	0.837		
	Reduction in account check and balance process error	0.826		
	Increase in customer satisfaction	0.822		
Energy Sustainability	Energy efficiency education	0.877	0.605	0.884
	Greener mainstream banking philosophy	0.705		
	Adoption of environmental technologies	0.796		
	Transparency on energy use by the employees	0.785		
	Report on energy use by the employees	0.713		

Note: Composite reliability (CR) = Square of the summation of the factor loadings)/{(square of the summation of the factor loadings) + (square of the error variances)}. Average variances extracted (AVE) = (summation of the square of the factor loadings)/{(summation of the square of the factor loadings) + (summation of the error variances)}

E. Discriminant Validity of the constructs

The discriminant validity as shown in Table 4 assesses if the unique concept of a particular construct is represented by another construct of the model. This wasevaluatedby comparing the square root of the average variance extracted values with the correlation values of each latent variable in the model. The correlation matrix along the diagonal represents the coefficient of AVE which indicates the achievement of discriminant validity through the values of each construct's AVE which is greater than its highest correlation with any other construct within the model.

Table 4:Discriminant Validity

	FP	OP	SEC
FP	**0.828098**		
OP	0.150288	**0.814727**	
SEC	0.292908	0.243918	**0.77777**

Note: the diagonals are the square roots of AVE while the off-diagonals are the latent variable correlations

F. Assessment of Structural Model

The PLS path analysis was assessed through the structural model to evaluate the effect of sustainable energy consumption on the performance of DMBs. Table 5 presents the result of the standard path coefficients (β), standard error, t-value, and the decision taken on the hypotheses. The stated effect of energy sustainability on financial and operational performance demonstrated evidences of a significant effects. Thehypotheses are significant at 10% (2-tail) having a t-value greater than the threshold of 1.282 (energy sustainability and financial performance (β = 0.316844; t = 1.860890, P < 0.10); energy sustainability and operational performance (β = 0.273080; t = 1.528126, P < 0.10)).

Table 5:Testing the hypotheses between energy sustainability

Relationship	Beta (B)	Std. Err	T-Stat.	Decision
SEC -> FP	0.317	0.157	1.861	Supported
SEC -> OP	0.273	0.160	1.528	Supported

Source: field report 2017

V. DISCUSSION

The result of the findings for the sources of energy consumed by deposit money banks has revealed that generating plant is the most prevalent source of energy used in the Nigerian deposit banks, followed by the use of power inverter and wind energy being the least use. The result indicates that the use of renewable energy has not been fully embraced by the Nigerian deposit money banks.This finding has provided an evidence to support the claim of [6] who asserted that Nigerian banks have turned to alternative sources of energy in running both the banking operations and after work banking services. While the implementation of solar panel has been at a pilot stage in some bank branches in Nigeria, the use of inverters as an alternative source of power has been perfected by the others in running their Automated Teller Machines (ATM) across the country. Uninterrupted Power Supply (UPS) devices are also being utilized by some of the banks in some of their operations.

Furthermore, the findings of the study revealed a low level ofenergy sustainability in the Nigerian deposit money banks. This finding is an evidence that sustainable energy consumption in the Nigerian deposit banks is still at the pilot levelas shown by the effort of many Nigerian deposit banks such as Sterling banks and Fidelity banks who have recently launched solar plans and adoption of uninterrupted power supply (UPS) devices and inverters to power its ATMs and major banking operations in order to cut operations costs.

Furthermore, the result of the test of hypothesis in this study revealed significant positive effects of energy sustainability on financial and operational performance of deposit money banks. This result implies that a unit improvement in the energy sustainability practices will increase the financial and operational performance of the deposit money banks in Nigeria. The result corroborates the findings of Cali and Cantore [9] which collected secondary data from World Bank survey to investigate the relationship between firm profitability and energy efficiency and concluded that switching to a more energy saving technologies could be more feasible on the

financial performance of banks even in the presence of large adoption costs.Sustainable consumption of energy has a tendency to lower the cost of utility, increase sales price and lower construction cost premiums on projects [7]. The finding of the study is in-line with the assertion of Conlon and Glavas [14] who revealed that banking facilities that embarked on sustainable energy consumption was able to improve its financial performance through cost savings on utility costs compared to firms without sustainable/green facilities. Hence, firms practicing sustainable energy consumption will achieve a better financial performance.

The study also found a significant positive effect of energy sustainability on the operational performance of deposit money banks indicating that a unit increase in the sustainable energy consumption will improve the operational performance of deposit money banks.This finding is in-line with the assertion of Conlon and Glavas [14] who stated that through sustainable consumption of energy, banking operations has increased in term of deposit customer and loan accounts.This finding has been evidenced among the deposit money banks in Nigeria who have recently awakened to the opportunities of energy and have thus, shifted their attention to using renewable energy such as solar power, inverters and uninterrupted Power Supply (UPS) devices are also being utilized by some of the banks in running their main banking operations and after hour operation without reverting to power generating plants.

VI. CONCLUSION

This study found a significant effect of energy sustainability on financial and operational performance of deposit money banks. Therefore, it concluded that sustainable energy practices are an important factor to consider in cutting cost and achieving better financial and operational performance in the banking industry. The study also concluded that there is a low level of sustainable energy consumption among the DMBs in Nigeria, therefore, it is recommended that more awareness should be created among deposit money banks in Nigeria to regard energy sustainability not only as a way of cutting cost but also as a means of achieving better financial and operational performance. The study therefore recommends that adoption of environmental technologies, energy efficiency education and investment in sustainable energy/green facilities be encouraged among deposit money banks to better reap the benefits of energy sustainability.

VII. LIMITATION OF THE STUDY

The researcher investigated the perception of the respondents due to the difficulties in assessing the financial status of the banks. Future researchers are hereby encouraged to use secondary data from the financial report of the banks.

REFERENCES

[1]. E. Borgstein, and R. Lamberts, "Developing energy consumption benchmarks for buildings: bankbranches in Brazil,"Energy and Buildings. vol. 82, pp. 82-91, 2014.
[2]. F. Ganda, and C. C. Ngwakwe, "Energy and carbon reduction practices in South Africanbanks, " Environmental Economics, vol. 5, no. 4,pp. 8–16, 2014.
[3]. RBS, "RBS environmental statement: Setting outour approach to ensure that RBS considersenvironmental issues in all parts of its operationsand business activities. Document ClassificationPublic | Version updated, July 2015.
[4]. Bank of America, "Environmental sustainability:our commitment to environmentalsustainability,"2015. Retrieved online on 10th January, 2017.
[5]. Vanguard News, "Energy financing: Nigerian banks come of age, 2014. Retrieved online 7th January 2017
[6]. Urhobo Today, "Nigerian bank turns to renewable energy to cut cost, 2016. Retrieved online from:http://urhobotoday.com/?p=24701 in July, 2016.
[7]. US Department of Energy, 2015 renewable energy data book
[8]. S. Zhang, "Energy efficiency and firm performance: Evidence from Sweedish industry, ADoctoral thesis submitted to Sweedish University of Agricultural Science, 2016
[9]. M. Cali, and N. Cantore, "Profitability and energy efficiency: a firm's fixed effect approach, 2010.
[10]. A. M. Abeberese, "Electricity cost and firm performance: Evidence from India," 2012. Retried online on 24th December, 2017.
[11]. A. M. ElMaraghy, H. A. Elmaraghy, and W. H.Elmaraghy, "Effect of changing operationpolicies on energy use consumption,"Procedia CIRP, vol. 41, pp. 301 – 306, 2016.
[12]. S. O. Oyedepo, "Energy in perspective ofsustainable development of Nigeria, " Sustainable Energy," vol. 1, no. 2, 14-25, 20, 2013.

[13]. F. Fuerst, "The financial rewards of sustainability: A global performance study of real estate investment trust," Social Science Research Network, 2015.
[14]. C. Conlon & N. Glavas, "The relationship between corporate sustainability and firm financial performance. Notre Dame Business School, 2012.
[15]. V. Krejcie, and D. W. Morgan, "Determining sample size for research activities,"Educationaland Psychological measurement, vol. 30, pp. 601-610, 1970.
[16]. U. Sekaran, and R. Bougie, "Research methods for business: A skill building approach"(5th ed.). United Kingdom: John Wiley & Sons Ltd, 2009.
[17]. C. M. Ringle, S. Wende, and A. Will, "Smart PLS 2.0. Retrieved from www.smartpls.de, 2005.World Bank, "The Potential Demand Response: Increasing Energy Efficiency Chapter 4.
[18]. J. F. Hair, G. T. Hult, C. M. Ringle, and M.Sarstedt, M. A primer on partial least squaresstructural equation modeling (PLS-SEM),"SagePublications Ltd., Thousand Oaks, Carlifornia,2013.
[19]. J. Lovel, "Breakthrough for sustainability in commercial real estate," Deloitte Center for Financial Service, 2010.

[1]Adebambo Hameed Olusegun; [2]Ogunjobi Victoria, Olutunbi
[1,2]Department of Project Management Technology, School of Management Technology
The Federal University of Technology Akure, Nigeria