Effect of Consumer Service Quality Enhancement on Continuous Payment Intention of Off-Grid Electricity Tariffs in Nigeria

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ABSTRACT
Evidence revealed that only 62% of Nigeria's population has access to electricity, the remaining 38% who live without electricity are mostly rural dwellers. Thus, Federal Government of Nigeria has been committed rural electrification expansion through fast and cost-effective strategy that will ensure electricity access in un-electrified rural areas through both on-grid and off-grid solutions. The major challenge in power sector is payment of electricity tariffs. Despite intervention by the Central Bank of Nigeria, the amount of unremitted debt was estimated at about N645.15 billion. This alarming situation may affect the sustainability of electricity projects. Therefore, this research tends to investigate the influence of consumer service quality factors - tangibles, responsiveness, assurance, empathy, and reliability on continuous payment of off-grid electricity tariffs. Data was collected using questionnaires from consumers of Jangefe Off-grid electricity project in Nigeria and was analyzed using Partial Least Square Structural Equation Modelling (PLS-SEM). The findings revealed a strong positive effects of tangibles, empathy, and reliability on continuous payment intention of Jangefe off-grid electricity tariffs. However, it was found that responsiveness to customer needs and assurance of the service have negative effects on continuous payment intention of off-grid electricity tariffs in the area. Thus, it is recommended that service providers of Jangefe off-grid project should enhance their responsiveness to customers as well as assurances in the service provision. This finding is expected to enhance sustainability of off-grid electrification project anchored through Rural Electricity Projects, which is vital to the achievement of the United Nations (UN) Sustainable Development Goals (SDGs) of making assess to clean and affordable electricity for all.

Keywords;Assurance, Continuous Intention, Electricity Tariffs, Empathy, Off-grid, Responsiveness, Reliability, Tangibles; Service Quality.

I. INTRODUCTION

The economic development of any nation heavily depends of reliable energy supply for household and industrial use. However, evidence shows that only 62% of Nigerian population has access to electricity, and the percentage without access to electricity are mostly rural dwellers in northern communities. Hence, Federal Government of Nigeria (FGN) through Rural Electrification Agency (REA) has been committed to bridge this gap through both on-grid and off-grid solutions, this has been mostly through utilization of mini-grid renewable energy sources for electricity generation which is easier to make available electricity to the remote areas (Mohammed, 2013). However, the major challenge in power sector is payment of electricity tariffs. Despite intervention by Central Bank of Nigeria, the amount of unremitted debt was estimated at about N645.15 billion. This alarming situation may affect the sustainability of commercial off-grid projects. Literature reports poor performance among electricity service providers ranging from non-investment in necessary equipment and human resources to poor management (Adedeji, 2017). In addition, several other challenges have been reported in the power sector including grid energy insufficiency and instability, network infrastructure

challenges (overloaded transformers and feeders, obsolete equipment, limited network, lack of automation), there is also tariff challenges and revenue shortfalls (non-cost reflective tariffs, low collection efficiency). Other challenges include metering challenges (huge metering gap, estimated billing, poor meter maintenance), and operational challenges (long feeders, quality of workforce, large operational areas).

While these challenges are mainly reported for on-grid electricity service providers. It implies the need to investigate the effect of consumer service quality on continuous payment of tariffs for mini off-grid projects which are just emerging so as to ensure its sustainability. The fact is that supply of electricity through off-grid solutions require high quality consumer service that will be affordable, reliable and responsible,provided through efficient and effective infrastructures and managed by employees with certain level of empathy. Literature documented the influence of consumer service quality on intention to use certain products and services. Specifically, Tarn (1999) and Alharthey (2019) found that service quality has influence on both purchase intention and customer loyalty, as well as post-purchase intention (Sardar Donighi & Yousefi, 2016) and repurchase intention (Rahmatulloh & Melinda, 2021), which implied continuous intention.

In line with these backgrounds, the motivations of this study are threefold. Firstly, there are paucity of literature on the influence of service quality factors on service usage or purchase intention within the context of developing African countries, especially Nigeria. Secondly, globally, there also less concentration of service quality assessment and its impact on consumer purchase intention within energy sector. Lastly, and more specifically the literature is lacking on service quality assessment of mini off-grid electricity projects and its potential impact of continuous intention to subscribe to such service. These gaps within the literature serves as the motivations of the study. In line with these motivations, the objective of this study is to examine the effect of consumer service quality on continuous payment intention of off-grid electricity tariffs, with the emphasis on Jangefe off-grid electrification projects as area of the study. The study will also cover six variables with continuous payment of off-grid tariff as the dependent variable, while tangibles, responsiveness, empathy, affordability and reliability as the independent variables.

To achieve its objectives, the paper is divided into five parts. This first part is introduction, it is followed by literature review in which literature links were established between service quality dimensions and intention. The third part contained methodology used in the study. The fourth part is result and discussion while the last part is conclusion and policy implication.

II.   LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK DEVELOPMENT

2.1 Continuous Payment Intention of Off-grid Electricity Tariffs

Companies always expect that a customer who had used their product or service will maintain such same passion of using its products or service. This brings about the issue of continuous intention which was been defined by Sardar Donighi and Yousefi, (2016) as intention to repurchase from the same company, according to previous experiences of the customer. In relation to mini off-grid electricity tariffs, continuous payment intention is considered as the consumers' intention to continuously and regularly pay for off-grid electricity tariffs based on their previous experience with the service. Literature documented that such continuous intention, otherwise call repurchase intention can be influenced among other factors by the quality of service provided. Specifically, it revealed that the quality of service provided to consumers by service providers have five important dimensions. These dimensions include; tangibles, responsiveness, affordability, empathy and reliability (Pakurár, Haddad, Nagy, Popp, & Oláh, 2019).   Therefore, in the next sections the relationship between each of these dimensions and continuous intention will be discussed, on the basis of which hypotheses of the study will be developed.

2.2   Tangibles and Continuous Payment Intention

Tangibles refers to the physical facilities (equipment, personnel, and communications materials). It is the physical image of the service that customers will use to assess quality (Parasuraman et al., 1988). Tangibles are associated with the physical facilities, tools, and machines used in order to provide the service, as well as representations of the services, such as statements, cards (debit and credit), speed, and efficiency of transactions (Parasuraman et al., 1988). Literature revealed that service quality such as efficient physical facilities affect consumer

continuous intention to subscribe to such services (Kuritsyn, 2014). Literature documented that tangible in one of the important service quality dimensions. However, literature on influence tangible as one of the dimensions of service quality has not been thoroughly investigated. Existing literature such as Tarn (1999), Alharthey (2019), Sardar Donighi & Yousefi (2016) and Rahmatulloh and Melinda (2021) mainly focus on aggregate service quality on consumer purchase intention. Therefore, with the decay of infrastructure in Nigeria, it highlight the importance of consumer service quality particularly tangible on continuance subscription of electricity service. Hence, in line with poor service quality in Nigeria, there is a need to investigate the extent to which provision of tangibles in terms of physical infrastructures for mini-grid electrification projects affect consumer continuous payment intention for mini off-grid electricity service tariffs. In line with this argument, the following hypothesis is developed:

H1: the extent to which efficient and effective tangibles equipment are provided for mini off-grid electrification projects significantly affect consumers' continuous intention to pay for off-grid electricity tariffs.

2.3 Responsiveness and Continuous Payment Intention

Responsiveness refers to the willingness of employees to tell customers exactly when things will be done, giving them undivided attention, promoting services, and responding in accordance with their requests (Parasuraman, Zeithaml, Berry, 1994). Although literature examined the influence of service quality on consumer intention such as Tarn (1999), Alharthey (2019), Sardar Donighi & Yousefi (2016) and Rahmatulloh and Melinda (2021), however, the focus was mainly on aggregate of consumer service quality not on its dimensions.Thus, it is important to explore the influence of responsiveness on continuous intention. This means that when employees of mini off-grid service providers are highly responsive such will persuade consumer to develop intention to continuously and regularly pay for the service. However, this is not empirically validated, hence, the following hypothesis is developed:

H2: the extent to which employees of mini off-grid service providers are responsive towards customer request will significantly affect consumers' continuous intention to pay for off-grid electricity tariffs.

2.4 Empathy and Continuous Payment Intention

Empathy refers to the ability of employees of a service providing firms to make customers need to feel that they are made priority by the organization providing services (Kuritsyn, 2014). Empathy means caring, paying personal attention, and providing services to customers (Parasuraman et al., 1994).The core of empathy is conveying the feeling that the customer is unique and special. It is important to note that literature indicate that aggregate of service quality dimensions including empathy have effect on consumer intention such as Tarn (1999), Alharthey (2019), Sardar Donighi & Yousefi (2016) and Rahmatulloh and Melinda (2021). However, despite the relevance on empathy on continuous intention or repurchase intention. It shows that when employees or staff of mini off-grid service providing company made customers priority, care and pay personal attention to them such will motivate them to continue to pay service tariff regularly. However, this has not been empirically validated with respect to mini off-grid service providers in Nigeria. Hence, the following hypothesis is developed:

H3: the extent to which employees of mini off-grid service providers make customers priority, care for them and pay personal attention to them through empathy will significantly affect consumers' continuous intention to pay for off-grid electricity tariffs.

2.5 Assurance and Continuous Payment Intention

Assurance refers to the employees' courtesy and knowledge, and their capacity to transfer confidence and trust to customers (Parasuraman et al., 1994). Assurance means keeping customers informed in their native language and listening to them, regardless of their educational level, age, and nationality (Kuritsyn, 2014). Parasuraman et al. (1994) states that assurance indicates the attitudes of the employees and their behavior, and the staff's ability to provide friendly, confidential, courteous, and competent services to customers (Kuritsyn, 2014). Although literature examined the effect of aggregate service quality on consumer intention and repurchase intention (Tarn, 1999; Alharthey, 2019; Sardar Donighi & Yousefi, 2016; Rahmatulloh & Melinda, 2021), however, literature on specific effects of assurance on consumer repurchase intention and continuous intention is lacking. This specific is important, because when employees of mini off-grid service provides treat customers with courtesy and interact with them in native language

regardless of their age, education and position, such customers will be more motivate to continue to subscribe to the service. However, this is not validated with regards to mini off-grid projects, hence, the following is developed:

H4: the extent to which employees of mini off-grid service providers treat customers with courtesy and interact courteously irrespective of their status will significantly affect consumers' continuous intention to pay for off-grid electricity tariffs.

2.6 Reliability and Continuous Payment Intention

Reliability refers to ability of an organization provide a service correctly the first time and in accordance with the expectation of the consumers (Parasuraman et al., 1988; Parasuraman et al., 1994). This means that reliability depicts an organization striving ability to to fulfil promises and pay attention to the results that will satisfy customers. However, existing literature focus on the aggregate effects of service quality on consumer intention and post-purchase intention

such as in the study of Tarn (1999), Alharthey (2019), Sardar Donighi and Yousefi (2016) and Rahmatulloh and Melinda (2021), the relevance of reliability in influencing consumer behavior including their continuous purchase intention has not been given desired consideration. However, it is common to believe that when firms that provide electricity using mini off-grid solutions in accordance with customer satisfied requirements and needs, through a service that is highly reliable such will motivate customers to make continuous payment for the service. However, this has not been validated empirically with respect to mini off-grid service, hence, the following hypothesis is developed:

H5: the extent to which mini off-grid service providers provide service correctly in accordance with customer expectation will significantly affect consumers' continuous intention to pay for off-grid electricity tariffs.

In line with these hypotheses, the following conceptual framework is proposed:

FIG. 1: Conceptual Framework of the Study

III.   METHODOLOGY

3.1 Research Design

The study deployed a quantitative research design considered asone of the types of approaches used in empirical research through using verifiable observations consistent with the theory or illusive reasoning different from conceptual or theoretical designs(Carlson, Vincent, Hardesty and Bearden, 2009). In line with this, the current study tends to examine the influence of service quality dimensions covering tangibles, responsiveness, empathy, assurance and reliability on continuous payment intention of mini off-grid electricity tariffs. In this, data was collected using questionnaire and transformed into numeric values for quantitative analysis.

3.2 Population and Sample

The subject of the study are consumers of mini off-grid electricity service with under Jangefe off-grid electrification projected financed under Rural Electrification Fund (REF) of the Rural Electrification Agency (REA), under its solar home connection program called Solar Home Naija. The estimated users according to Akande (2021) 5,000 population of Jangefe community in Jigawa State Nigeria. Therefore, a sample of 357 consumers were surveyed, since the consumers in the area are 5,000. Therefore, using Krejcie and Morgan (1970)

sample size estimation tablethe approximate sample size for the population of 5,000 people is 357 respondents.

A none probability sampling techniques was adopted. The purpose for using this sampling technique instead of probability sampling can be justified by the fact that the exact list of off-grid electricity consumers in the area is not commonly available. Hence, convenience was used based on the availability of consumers who are easily accessible. Upon extensive effort a total of 192 valid responses were obtained which accounted for 53.78% response rate, thus, considered sufficient in line with the recommendation of Sekaran (2003).

3.3 Instrumentation and Data collection

Data was collected using a research questionnaire designed for the purpose. The questionnaire was designed using questions relating to consumer service quality dimensions adopted fromUzir, et al. (2021) and continuous payment intention from Lee, Sung and Jeon (2019). Specifically, section one contains the demographic variables of the respondents including gender, age, marital status, qualification, nature of energy usage (home or business), family size, employee size and income levels. The second section contains

question relating to the dependent variable-continuous payment intention which was measured using four items adapted and modified from Lee, Sung and Jeon (2019). The remaining sections contain questions relating to tangibles, responsiveness, assurance, empathy and reliability each measured using five items except empathy which was measured using four items, all these were adapted from Uzir, et al. (2021).Four data collectors were engaged and trained who had assisted in the data collection.

3.4 Model Specification and Data Analysis
For the purpose of the simple multiple regression was used in the study, the research model is expressed as follows:

$$CPI_i = \beta 0 + \beta 1\ TAN_i + \beta 2\ RESP_i + \beta 3\ EMP_i + \beta 4\ ASS_i = + \beta 5\ REL_i + \dot{\varepsilon}_i \ldots \ldots \ldots eq1$$

Where:

CPI = Continuous Payment Intention of Off-grid Electricity Tariffs
$\beta 0$ = Beta value of the constant
$\beta 1 - \beta 7$ = Beta values of independent variables (Tangibles, Responsiveness, Empathy, Assurance and Reliability) respectively
i = Cross-sectional observations

$\dot{\varepsilon}_i$ = Error term

In line with the regression model expressed above, Partial Least Square Structural Equation Modelling (PLS-SEM) was deployed that has an inbuilt regression analysis tool using path modeling. In this, continuous payment intention was used as dependent variable, whereas, tangibles, responsiveness, assurance, empathy and reliability which are the dimensions of consumer service quality were used as the independent variables.

IV.   RESULTS AND DISCUSSIONS
In this section results obtained after the data of the study was analyzed is presented. This commences with the presentation of the demographic profile of the respondents and then the PLS-SEM analysis which covers both measurement and structural models results.

4.1 Demographic Profile of the Respondents
This section presents the demographic profile of the respondents including; gender, age, marital status, qualification, nature of electricity usage, family size, employees size and monthly income. These are presented in Table 1 below.

Table 1: Demographic Profile of the Respondents

Demographic Profile	Frequency	Percentage
Gender		
Male	142	74
Female	50	26
Total	**192**	**100**
Age		
Below Years	47	24.5
30 - 40 Years	86	44.8
Above 40 Years	59	30.7
Total	**192**	**100**
Marital Status		
Single	31	16.1
Married	141	73.4
Divorced	20	10.4
Total	**192**	**100**
Education		
None Formal Education	92	47.9
Primary	63	32.8
Secondary	36	18.8
Tertiary	1	0.5
Total	**192**	**100**
Solar Usage		
Household	71	37
Business	61	31.8
Both	60	31.2
Total	**192**	**100**

Family Size		
One	26	13.5
Two	29	15.1
Three	36	18.8
Four	48	25.0
Five	10	5.2
Above Five	43	22.4
Total	**192**	**100**
Number of Employees		
None	73	38
One	26	13.5
Two	44	22.9
Three	39	20.3
Four	4	2.1
Five	6	3.1
Above Five	0	0
Total	**192**	**100**
Income Level		
N5,000-N29,999	64	33.3
N30,000 - N49,999	98	51.1
N50,000 and Above	30	15.6
Total	**192**	**100**

The demographic analysis revealed that 192 valid responses were obtained of which 74% were male while the remaining are females. Majority of the respondents are married, aged between 30-40 years and most of them have no any form of formal education. Most of the consumers used the solar for household compared to commercial usage for phone charging, and the usage is higher for individuals with larger family sizes, and small sizes of employees and the income level of the majority of the users ranged between N30,000-N49,999 in a month.

4.2 PLS-SEM Results
In analyzing the data using PLS-SEM, two-stage approach recommended by Hair, Ringle and Sarstedt (2011) was deployed. These are assessment of measurement model and structural model results. The essence of the measurement

model as suggested by Hair, Ringle and Sarstedt (2011), is to assess the reliability and validity of the instrument using in collecting data while structural model is used to test the hypotheses of the study and assess the quality of the model. The results from these two assessments are presented in the following subsections.

4.2.1 PLS-SEM Measurement Model Results
The assessment of PLS-SEM measurement model is undertaken using four criteria in accordance with the suggestion of Hair et al. (2011). This include assessment of indicator reliability, internal consistency reliability, convergent validity and discriminant validity. The assessment of these criteria was undertaken using threshold values suggested by Hair, et al. (2011). The result is presented in Table2 below:

Table 2: Indicator Reliability, Internal Consistency Reliability and Convergent Validity

Variables	Items	Loadings	Cronbach's Alpha	rho_A	Composite Reliability	AVE
	A1	0.94				
	A2	0.85				
Assurance	A3	0.93	0.946	0.964	0.959	0.824
	A4	0.97				
	A5	0.86				
	E1	0.62				
Empathy	E2	0.90	0.85	0.919	0.900	0.698

	E3	0.90				
	E4	0.90				
Continuous Intention	INT1	0.94				
	INT2	0.92	0.935	0.945	0.953	0.836
	INT3	0.90				
	INT4	0.90				
Reliability	REL1	0.63				
	REL2	0.94				
	REL3	0.84	0.813	0.831	0.850	0.545
	REL4	0.44				
Responsiveness	REL5	0.73				
	RES1	0.92				
	RES2	0.91	0.861	0.990	0.906	0.764
	RES5	0.78				
Tangibles	T1	0.96				
	T2	0.94	0.962	0.966	0.972	0.896
	T3	0.93				
	T4	0.95				

The results of indicator reliability, internal consistency reliability and convergent validity are presented in Table 2 above. Indicator reliability was assessed using indicator loadings based on the suggested threshold of 0.7 and above, though Hair et al (2011) recommend the retention of indicators with loading of 0.4 and above unless if its deletion will result in the improvement of the Average Variance Extracted (AVE). In line with this suggestion, it can be said the all the indicators have met the requirement of 0.7 except E1 for empathy, and REL1, REL4 for reliability. These were not deleted as the AVE requirements of 0.5 has been met for their respective variables.

The next criteria which is internal consistency reliability was assessed using 3 criteria; Cronbach's alpha, rho_A and composite reliability. All the three criteria revealed strong internal consistency reliability for all the variables based on the suggested threshold of 0.70 and above as applied by Imran, Hamid, and Aziz (2018). The result of convergent validity as measured by AVE suggested that all the variables met convergent validity requirements. The AVE of each of the constructs exceed the minimum threshold of 0.5. The last criterion for the assessment of measurement model is discriminant validity, the result of which is presented in Table 3 below.

Table 3: Fornell-Larcker Criterion

Constructs	1	2	3	4	5	6
Assurance	**0.908**					
Empathy	0.595	**0.835**				
Continuous Intention	0.365	0.285	**0.914**			
Reliability	0.719	0.712	0.430	**0.738**		
Responsiveness	0.549	0.787	0.250	0.725	**0.874**	
Tangibles	0.803	0.525	0.498	0.625	0.725	**0.947**

The discriminant validity was assessed using Fornell-Larcker criterion. The requirement is that the square root of AVE of each of the variables should be greater than its squared correlation with any other variable in the model. This requirement has been achieved as shown in Table 3 above.

Therefore, it is clear that the measurement model achieved all its requirements. This implied that the data is reliable and valid for purpose of testing the hypothesis of the study. Thus, the results of the structural model are presented in the following sections.

4.2.2 PLS-SEM Structural Model Results
The structural model is also assessed using five criteria (Hair, et al.,2011). These include; assessments of the significance of path coefficients for testing the hypotheses of the study, assessment of R-Squared (R2) for evaluating the explanatory power of all the independent variables on the dependent variables, the assessment of the effect size (f2) for evaluating the specific effect of each of

the independent variables separately on the dependent variable, the assessment of the predictive relevance (Q2) for evaluating the predictive power of the model even in the absence of the missing cases. The last is the assessment of the model fits criteria using SRMR. The results of these assessments are presented in Table 4-8 below.

4.2.2.1 Path Coefficients for Hypotheses Testing
The assessment of the significance of path coefficients for testing the hypotheses of the study was undertaken using the bootstrapping by utilizing the 5000 samples and 192 cases. The criteria used for assessing the significance level is t-statistics and p-values using the thresholds recommended by Hair et al (2011) as presented in Table 4 below.

Table 4: Path Coefficients for Hypotheses Testing

Hypotheses	Beta	SE	T statistics	P values	Decision
Tangibles -> Cont. Intention	1.011	0.168	6.008	0.000	Supported
Responsiveness -> Cont. Intention	-0.789	0.175	4.502	0.000	Supported
Empathy -> Cont. Intention	0.498	0.137	3.626	0.000	Supported
Reliability -> Cont. Intention	0.274	0.158	1.740	0.082	Supported
Assurance -> Cont. Intention	-0.534	0.202	2.647	0.008	Supported

The result from Table 4 revealed that all the five hypotheses of the study are supported, although with different directions of the relationships. In specifics, the result of the hypothesis one which proposed that the extent to which efficient and effective tangibles equipment are provided for off-grid electrification projects significantly affect consumers' continuous intention to pay for off-grid electricity tariffs. The finding revealed a strong positive relationship between tangibles provided by Solar Power Naija and continuous payment intention of tariffs by the customers under the Jangefe mini off-grid projects (β=1.011,t= 6.008, P=0.000). This implied that the user will continue to pay electricity tariffs of Solar Power Naija based on the   modern-looking equipment provided,   state of the art tool and devices, neatness in employee appearing, the visually appealing nature of its materials. The more these tangibles are maintained the more continuous payment intention by the consumers.

The second hypotheses of the study postulates that the extent to which employees ofoff-grid service providers are responsive towards customer needs will significantly affect consumers' continuous intention to pay for off-grid electricity tariffs. The result revealed significant but negative relationship between responsiveness to customer

needs and their continuous intention to pay electricity tariffs under Solar Power Naija (β=-0.789,t= 4.502, P=0.000). This means that for the fact that customers spent much time waiting for the staff of Solar Power Naija to attend to their need, not acting quick in eliminating potential errors, and not much quicker in responding to customer will reduce the customers intention to continuously pay the electricity tariffs in Jangefe community under Solar Power Naija Program.

The third hypothesis proposed that the extent to which employees of mini off-grid service providers make customers priority, care for them and pay personal attention to them through empathy will significantly affect consumers' continuous intention to pay for off-grid electricity tariffs. The result from the test of this hypothesis revealed significant positive relationship between empathy and continuous payment intention of off-grid project (β=-0.498,t= 3.626, P=0.000). This means that the use personal initiative to fulfill customer requests, convenience operating hours to attend to the needs of customers, putting a priority on customers' interests and putting extra effort into serving customer special requests by solar employees at Jangefe project boost customers' continuous payment intention of electricity tariffs.

The fourth objectives of the study postulated that the extent to which employees of mini off-grid service providers treat customers with courtesy and interact courteously irrespective of their status will significantly affect consumers' continuous intention to pay for off-grid electricity tariffs. The result from the test of this hypotheses revealed a significant positive relationship between the reliability and continuous payment intention of off-grid electricity tariffs (β=0.274,t= 1.740, P=0.082). This means that when customer has a problem, Solar Power Naija employees show sincere interest in solving it, correctly performs the service right the very first time, provide correct and error free records (calculate electricity bill) and maintain confidentiality and privacy of customers, which eventually increase the intention to continuously pay the electricity tariffs.

The last hypothesis proposed that the extent to which mini off-grid service providers provide service correctly in accordance with customer expectation, that is assurance will significantly affect consumers' continuous intention to pay for off-grid electricity tariffs. The result from the test of this hypothesis revealed that assurance has a significant negative relationship with consumers' continuous payment intention of off-grid electricity tariffs in Nigeria (β=-0.534,t= 2.647, P=0.008). This means that when having employees with less experience in their jobs, not giving complete answers to customers' questions, consistently courteous towards customer and customer feel safe and secure in using electricity provide by Solar Power Naija that boosts customers' intention to continuously pay electricity tariffs.

4.2.2.2 Assessment of Coefficient of Determination (R^2)
The second criterion used in assessing the structural model is coefficient of determination that is R-square which measures the variance of the endogenous variables explained by the exogenous constructs. It was assessed using the threshold recommended by Cohen (1989) classified into three categories of 0.26 and above as substantial, 0.13 to less than 0.26 as moderate, 0.02 to less than 0.13 as weak. The result is presented in Table 5 below.

Table 5: Coefficient of Determination (R^2)

Endogenous Construct	R-square	R-square adjusted
Continuous Intention	0.371	0.354

From Table 5, it can be seen that the R^2 of the model is 0.371 or 37.1% while the adjusted R-squared is 0.354 or 35.4%. The means that assurance, empathy, reliability, responsiveness and tangible explained 35.4% of the variations of continuous payment intention of electricity tariffs, while the remaining 64.6% could be explained by other variables not included in the current model. Therefore, in line with Cohen (1989), the values of the R-squared in this study can be considered as substantial.

4.2.2.3 Assessment of Effect Sizes (f^2)
Assessment of the effect sizes of each of the independent variable on the dependent variable is the third criteria used in assessing the structural model of this study. Effect size measures the individual effects of each of the exogenous construct on the exogenous construct. It was assessed based the threshold recommended by Cohen (1988) classified into three categories of f^2 values of 0.35, 0.15, and 0.02 as large, medium, and small respectively as depicted inTable 6 below.

Table 6: Assessment of the Effect Sizes

Exogenous Constructs	f^2	Effects
Assurance	0.094	Small
Empathy	0.097	Small
Reliability	0.021	Small
Responsiveness	0.182	Medium
Tangibles	0.273	Medium

The result in Table 6 revealed that, responsiveness (0.18) and tangibles (0.27) have medium effects on continuous payment intention of off-grid electricity tariffs at Jangefe community

project, while assurance (0.9), empathy (0.9) and reliability (02) have small effects respectively.

4.2.2.4 Assessment of Predictive Relevance (Q^2)
 Assessment of the predictive relevance (Q^2) is the fourth criterion used in assessing the structural model of this study. It is assessed using the threshold recommended by Stone and Geisser Q^2 (Geisser, 1975; Stone, 1974) who suggested predictive relevance to be calculated using blinding procedure available in Smart PLS.It assesses the predictive capacity of the PLS-SEM structural model through systematic deletion and subsequent prediction of every data point of the indicators of an endogenous construct in the model. Thus, blindfolding Q^2 test was used in this study to observe the predictive capability of the items of the endogenousvariable. Using the recommendations of Geisser (1975) and Stone (1974), a model is said to have a predictive relevance when the value of the $Q^2$is above zero. The result of this assessment is presented in Table 7.

Table 7: Predictive Relevance (Q^2)

Endogenous Construct	Q²predict	RMSE	MAE
Continuous Intention	0.323	0.832	0.589

 Table 7 presented the result of the predictive relevance of the model. In obtaining this result, a blindfolding test was conducted using construct cross-validated redundancy in the Smart PLS. The result showed that the model is of adequate fit and predictive power as the Q^2 value is 0.323 which is far above zero.

4.2.2.5 Assessment of Model Fit
The model fit was assessed using Standardized Root Mean Squared Residual (SRMR) based on the threshold recommended by Asparouhov and Muthén (2018). The result is presented in Table 8 below.

Table 8: Model Fit Indices

Indices	Saturated model	Estimated model
SRMR	0.13	0.13

 The result in Table 8 showed that the values of both the saturated and estimated models revealed SRMR of 0.13 which is above the minimum threshold of 0.08 highlighted by Asparouhov and Muthén (2018). Literature showed that a minimum value of SRMR should be 0.08 with higher value closer to 1 revealing a better fit for a research model. Thus, it implied that the current model presented in this paper achieved a good fit.

V.   CONCLUSION AND IMPLICATIONS
 The paper examined the effect of consumer service quality on continuous payment intention of electricity tariffs, with the emphasis on Jangefe off-grid electrification projects in Nigeria. The result revealed a strong positive effects of tangibles provided by Solar Power Naija, empathy of its employees and reliability of employees and the service on continuous payment intention of off-grid electricity tariffs. However, it was found that responsiveness to customer needs and assurance of the service have negative effects on continuous payment intention of off-grid electricity tariffs in the area.

5.1 Theoretical and Practical Implications
 The paper has threefold of theoretical implications. Firstly, the application of Parasuraman et al. (1988) and Parasuraman et al. (1994) service quality dimension is not common within off-grid energy sector despite it relevance is service quality evaluation. This study provides an evidence and validate the measures and dimension of service quality within new setting. Secondly, the application of the dimension is also not commonly available within Nigeria service sectors especially in relation to continuous purchase or usage intention. This study bridges this theoretical gap in applying both measurements and dimensions of service quality within this context. Thirdly, most of the earlier studies paid emphasis on the effects of the overall service quality not the effect of the individual dimensions on the intention and repurchase (continuous intention) for instance; Tarn (1999), Alharthey (2019), Sardar Donighi & Yousefi (2016) and Rahmatulloh and Melinda (2021). This study bridges this theoretical gap in the literature by studying the effect of the individual dimension of consumer service quality assessments instead of the overall construct.

The findings from the study has implications to the service operators of off-grid electricity services particularly in the area of the study. Firstly, there are areas in which they are doing better such has in the provision of tangibles. In this the consumers believed that modern-looking equipment, state of the art tool and devices, neatness in employee appearing and materials are of visually appealing nature. They also believed that employees use personal initiative to fulfill customer requests, have convenience operating hours to attend to the needs of customers, putting a priority on customers' interests and putting extra effort into serving customer special requests. Furthermore, employees show sincere interest in solving problems, correctly performs the service right the very first time, provide correct and error free records (calculate electricity bill) and maintain confidentiality and privacy of customers. These qualities in essence enhance the consumer intention to continuously pay the agreed tariffs. Thus, it is recommended that the operators should maintained the attained qualities in order to ensure the sustainability of the service and customer loyalty. Secondly, there are also some observed setbacks that need to be attended. For instance, consumers are of the view that sometimes they spent much time in waiting for the staff to attend to the problem experienced such as replacement of damaged items and some repairs, thus, not acting quick in eliminating potential errors, and not much quicker in responding to customers needs of repairs. This in essence will reduce the customers intention to continuously pay the electricity tariffs in Jangefe community under Solar Power Naija Program.

Therefore, addressing the above concerns will improve business model sustainability, by persuading consumers pay their electricity bills regularly and continuously so as to ensure the sustainability of the projects and also ensure project payback and profitability. Thus, this enable retention customer and getting their loyalty thereby encouraging other private sector investors into the sector and attract more into mini grid development project by further exploiting the large opportunity in mini-grid markets which stands at about $9.2B/year (₦3.2T/year), this will eventually save $4.4B/year (₦1.5T/year) for Nigerian homes and businesses due to cheaper nature compared to gasoline engines.

REFERENCES
[1]. Adedeji, A. O. (2017). Privatisation and Performance of Electricity Distribution Companies in Nigeria. Journal of Public Administration and Governance, 7(3), 190-203.

[2]. Akande, L. (2021). Osinbajo inaugurates solar power programme in Jigawa. Available online at: https://www.thecable.ng/osinbajo-inaugurates-solar-power-programme-in-jigawa

[3]. Alharthey, D. B. (2019). Impact of service quality on customer trust, purchase intention and store loyalty, with mediating role of customers' satisfaction on customer trust and purchase intention: Study of grocery shopping. British Journal of Marketing Studies, 7(2), 40-61.

[4]. Asparouhov, T., & Muthén, B. (2018). SRMR in Mplus. Retreived from: http://www. statmodel. com/download/SRMR2. pdf.

[5]. Carlson, J. P., Vincent, L. H., Hardesty, D. M., & Bearden, W. O. (2009). Objective and subjective knowledge relationships: A quantitative analysis of consumer research findings. Journal of Consumer Research, 35(5), 864-876.

[6]. Imran, M., Hamid, S. N. B. A., & Aziz, A. (2018). The influence of TQM on export performance of SMEs: Empirical evidence from manufacturing sector in Pakistan using PLS-SEM. Management Science Letters, 8(5), 483-496.

[7]. Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. Educational and psychological measurement, 30(3), 607-610.

[8]. Kuritsyn, G. (2014). Service Quality in Video Surveillance-as-a-Service: Developing Measures and Analyzing Its Function in Continuance Usage Intention. 成功大學國際經營管理研究所碩士在職專班學位論文, 1-71.

[9]. Lee, S. W., Sung, H. J., & Jeon, H. M. (2019). Determinants of continuous intention on food delivery apps: extending UTAUT2 with information quality. Sustainability, 11(11), 3141.

[10]. Pakurár, M., Haddad, H., Nagy, J., Popp, J., & Oláh, J. (2019). The service quality dimensions that affect customer satisfaction

in the Jordanian banking sector. Sustainability, 11(4), 1113.

[11]. Parasuraman, A.; Zeithaml, V.A.; Berry, L.L (1994). Reassessment of expectations as a comparison standard on measuring service quality: Implications for further research. J. Mark, 58, 111–124.

[12]. Parasuraman, A.; Zeithaml, V.A.; Berry, L.L. Servqual (1988.: A multiple-item scale for measuring consumer perc. J. Retail, 64, 12.

[13]. Rahmatulloh, M. Z. A., & Melinda, T. (2021). Analysis of the Effect of Service Quality and Customer Satisfaction on the Repurchase Intention, Word of Mouth and Customer Retention for Party Equipment Rental ``Suyono" in Surabaya. KnE Social Sciences, 46-56.

[14]. Sardar Donighi, S., & Yousefi, M. (2016). Impact of service quality and perceived value on post-purchase intention with mediation of customer satisfaction (Case Study: Pharmacies in Tehran, Iran). European Online Journal of Natural and Social Sciences: Proceedings, 4(1 (s)), pp-1472.

[15]. Sekaran, U. (2003). Determining sample size. Sekaran. Uma (4th Eds.), Research methods for business: A skill building approach, 263-298.

[16]. Tarn, J. L. (1999). The effects of service quality, perceived value and customer satisfaction on behavioral intentions. Journal of Hospitality & Leisure Marketing, 6(4), 31-43.

[17]. Uzir, M. U. H., Al Halbusi, H., Thurasamy, R., Hock, R. L. T., Aljaberi, M. A., Hasan, N., & Hamid, M. (2021). The effects of service quality, perceived value and trust in home delivery service personnel on customer satisfaction: Evidence from a developing country. Journal of Retailing and Consumer Services, 63, 102721.