OFF-GRID POWER MARKET SURVEY FOR THE RETAIL SECTOR OF NIGERIA

Study Report
- analysis and reporting by shop types and business types
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Prepared for:

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Improving Income and Employment Opportunities

within Nigeria's wholesale and Retail Sector

Implemented by

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EXECUTIVE SUMMARY

The aim of this assignment was to undertake a market survey to assess the commercial viability of off-grid power demand from the retail sector of Nigeria. This requires an understanding of the power needs of retailers and quantifying the financial opportunities for energy providers. This project is designed to capture and document the current baseline information status of targeted beneficiary groups.

The approach involved collecting both qualitative and quantitative information from target groups in three states in Nigeria, viz: Lagos, Cross River and Kano. The target groups were wholesalers and retailers, market authorities and associations in formal and informal markets across the study locations, off-grid and on-grid energy providers – that is individuals/companies that provide alternative sources of energy and from the national electricity body (PHCN) respectively, regulatory bodies including ministry of environment and state electricity board, and from independent energy providers. The data collection and management, data analyses and report writing were implemented by the Strategic Research and Management (STREAM) Insight Nigeria Limited, located in Lagos, Nigeria.

Primary (new data/real time) data was utilized in the study. Data was collected through qualitative approach - In-depth Interviews (IDIs) and quantitative survey.

This report is a collection of our observations from the responses of the target groups, which is a combination of experts/providers/suppliers, regulators and consumers (traders). Our findings offers deep insight on existing and alternative energy sources, the perception and demand for alternative energy as well as types including, but not limited to generating sets, solar and inverter. We also considered existing laws and how they can affect the uptake of these energy sources by the retail sector. The observations from the different stakeholder groups on specific/thematic areas are summarized here.

IN-DEPTH INTERVIEWS (IDIs)

Market authorities/association members were sampled in various markets, which were stratified into urban, peri-urban and rural. They are listed for the various locations of study: In Calabar: Watt and Marian (urban); Ikom Central, Okuku, Okurikang, and Ishibori (peri-urban); Iwuru, and Uyanga (rural). In Lagos: Idumota, Dosunmu, and Balogun (urban); Computer village, Ogba, Sabo, Oja-oba in Ketu, Ile-Epo, Ojota, and Alaba Int'l (peri-urban); Seme Border daily market, and Round About Int'l markets (rural). In Kano: Abubakar Rimi, Yankura and Tarauni markets are all in the urban area.

Generally there are laws/rules and regulations guiding the business activities in about all the markets such as the number of days for trading as well as time these markets are opened and closed daily. Also how and what energy source is used. While these regulations are tougher in some, they are somewhat subtle in others.

Business activities in terms of the number of days traders operate weekly vary, depending on the market and location. Some markets have business activities every day in the week, Mondays through Sundays. This include the Ogba market, Oja-oba, Ketu, Seme, Ile-Epo and Sabo markets in Lagos; Yankura, Sabon-geri (Abubakar-Rimi) and Tarauni markets in Kano. All the markets (used for the IDIs) in Kano have business activities every day. The Ikom market in Calabar also exhibit similar pattern, except that Sundays are not busy with market activities compared to the other days.

The time of market opening and closing also vary for each market in the various locations of study. Generally, across the various locations, most markets are opened for business activities between 5 and 6 AM through 5 and 7PM, on typical market days, weekend inclusive. In some markets, there are no laws controlling time to open and close, though major business activities wane by 9pm.

Generally, there are periods of inactiveness that affect business functions for some hours or about the entire day or days, depending on the event. Such periods include market sanitations, market association meetings, government (at all levels – federal, state or local) declared events that necessarily include market closure, and during special circumstances such as closing the market for traders to register for/collect voters' card (an example was in Marian market in Calabar). The most common is sanitation exercise, which are compulsory in some markets. Sanitation is compulsory in all markets in Lagos and usually up till 10am on Thursdays. There is no market activity during this period as there are strict fines on any trading outlet that does not observe this exercise.

Generally, traders in many of the markets use both the national electricity power source (PHCN) and or other alternatives such as power generating set. Markets where both power sources are used include; Marian, Watt, Ikom, and the Ishibori markets in Calabar and the Computer village, Ogba, Sabo, Dosunmu, Ojota, Round About and Alaba International in Lagos as well as Sabon-geri in Kano. Due to lack of regular national electric power supply in about all the market, the alternative power is used more.

In terms of availability, the market authority/association executives believed the alternative power (mainly from power generator) is much more available than nationally supplied power. Some markets rarely or never receive daily regular power supply from the national electricity source (PHCN), and sometimes it may be weeks, months or years. In some of the markets, traders use alternative power only. Markets such as the Okuku, Iwuru and Uyanga markets in Calabar and the Seme border, have never had PHCN power supply. This is because they are either not connected to the national grid (e.g. Seme boarder market) or have not had electricity supply in a long time

The most used alternative energy source in about all the market is the power generating set. It is considered to be readily available and affordable for any trader, since they come in different sizes and prices

Although there is more demand for and consumption of alternative power due to the inconsistency in the national electricity supply, there were complaints on how expensive using these alternative energy can be for traders. The cost of running the generating set include but not limited to the huge amount spent on fuel (gasoline) which ranges between N5000 to N90,000 monthly (for markets in Lagos and Calabar) or as low as N3,000 for markets in the North (because many of them use *maja*). The *maja* system involves an alternative source of power supply where a person buys a large generating set in the market and supplies some business owners power from that single source at a cheap and affordable cost. These suppliers of energy are referred to as independent energy providers. They are popularly called '*maja*' in the Kano.

When compared to the cost of using nationally supplied power, traders do not have a better preference for alternative power, as it often cost more than the cost of national electricity. However, due to the unavailability of national power, they are constrained to use alternative sources.

To limit the cost of using individual power generating set, some markets also use a central generating set to supply power to many businesses within the market. Alaba international uses such model. A similar model is the independent energy provider concept used as the most reliable alternative source of power for all the sampled markets in Kano. Usually, it is cheap and affordable, though it is still not considered cheaper than supply from the national grid. Majority of the traders pay N100 daily for the *maja*, a few pay N200, depending on their energy consumption.

The heads of the associations also reported that there is a direct relationship between the availability of electricity and the trading hours, that access to electricity greatly limits their trading hours. From the perspectives of the markets authority and associations members, if power were available all the time in the market, the impact will be far reaching on businesses. The availability of power makes traders stock up goods and expand their businesses as they are assured of less spoilage of goods, especially perishables, regular patronage from customers and increased sales, and extended trading hours.

Generally, there is a good level of awareness of the solar energy, but much is not known of the costs of set-up, maintenance and reliability. On a positive note, the market executives confirmed there are roofs or other open locations available for the installation of solar panels in the markets. They also confirmed that the markets are safe to accommodate the installation of solar panels, given that some of them leave their generating sets in the markets and have not encountered any challenge. There are paid security personnel that guard the markets.

Overall, there is willingness to uptake solar energy as an alternative source of power in the markets. There are market rules that restrict/guide the use of power generating set, except at the Oja-Oba, Ketu and Round-about Intl markets in Lagos, where no trader is allowed to use power generator or any alternative power source that use petrol or diesel, to avoid fire outbreak. These laws are not enforced so long the alternative power source does not use petrol or diesel, such as the solar energy. **There are no laws nor any form of restriction in any market or by any regulatory body on the use of solar or inverter as alternative energy.** This was affirmed by all the stakeholder groups in this study. It can therefore be inferred that solar energy would be the most suitable alternative source of energy for such markets.

Off-Grid Energy Providers

Generally, most of the off-grid providers have their customers as the general public; those in Cross River mentioned that they have customers including government facilities, households, pharmacy shops and small businesses. The off-grid providers in Lagos mentioned that their customers cut across barbing saloons, phone charging business and individuals. However, reaching the markets has been a challenge, particularly in terms of stimulating their interest to use the services.

Challenges identified by the off-grid energy providers are poor/lack of awareness of solar energy and the cost of installation of solar panels which may be too expensive for some to afford. Some other challenges identified by the off-grid energy providers include delays in getting bank confirmation alerts from customers for payment of services rendered or product supplied and the failure in technology of the POS devices. Generally, the option of installmental payment for customers is available; though it is rarely considered due to lack of trust between providers and consumers, and the latter has been observed to default.

Though the off-grid energy providers are aware of mobile money services, they consider it not very accessible and they would prefer to use POS or other forms of transactions apart from Mobile money services. Except for one provider from Lagos, others do not make use of any loan facilities because it is not readily accessible and very discouraging.

On-Grid Energy Providers

According to the on-grid providers, for optimal capacity, Lagos requires about 2,000 MW of energy and Kano national electricity station will require 1,200MW of energy. Overall, a notable challenge in meeting the power needs of customers is that the demand for power supersedes the supply. There are too many households, but less available power.

In Kano about 40% of the households are yet to have electricity from the National electricity, an opportunity for Off-Grid Power. It was also reported that in Kano, though efforts have been made to connect these distant areas to the main electricity grid by erecting electricity poles, the indigenes of the towns have refused to connect electricity in their homes even when poles are connected, sometimes due to lack of financial capacity to purchase the necessary materials such as electric wires, to connect to the poles. In Lagos and Cross River state, there are areas that are not connected

to the national electricity grid although these areas are a fewer in Lagos than in Cross River, an example of such an area in Lagos is Ayobo Aiyetoro.

Power is provided to trading locations in each of the three states with no restrictions in Lagos or Kano state. In Cross River State, 11KVA feeder cable is used to supply power into markets and this is seen as a restriction on the amount of power given to the trading locations because it is dangerous to feed high amounts of energy into the trading locations for safety reasons. On whether this is enough to be sufficient for the needs of the locations is another question, though there was no suggestion to suggest otherwise.

There are no government regulatory laws that control the source of power to be used in the markets in all of the three states and as such all traders are permitted to use whatever source of power/electricity they prefer. These providers also supported the observations that traders are at liberty to use both or either the national grid electricity and/or alternative power. Traders and individuals use more of alternative sources of power than they would use national electricity because of its inconsistency.

Regulatory bodies (Ministry of Environment and State Regulatory Boards)

The regulatory bodies confirmed that there are government regulatory laws that control the source of power to be used as well as the operation of alternative power in markets. They also emphasized the preference for solar energy because it does not produce any form of pollution.

Information on whether there are government regulatory registration fees and dues/payments that are expected to be paid by energy providers before they can operate in markets was also provided. In Kano state the only charges expected to be paid are the monthly market revenue fees/levies. In Cross River state, though no specific law has been instituted yet, there was a consideration for such. For instance, an operator using a 5KVA generating set to provide power will pay a certain (unspecified) amount to the government. These fees are based on the size of the generators. However, the specific amount was stated, but for those who provide solar energy, no charges will be demanded because they make use of renewable energy and as such no pollution.

QUANTITATIVE SURVEY AMONG TRADERS

Traders' profile and demographics

- More than a quarter of the traders sampled sell FMCGs, about a quarter sells clothes/shoes/bags, 11%; computer/electrical appliances, 9%; care products/pharmaceuticals, 7% other foods and 3% sell fresh food items. These percentages represent the proportions found in the markets.
- Generally, two-third of the traders are males whereas in Kano, 9 out of every 10 trader is a male.
- The mean age of traders was observed to be 34 years among all traders, same was reported for the different outlets.
- Generally, 6 out of every 10 traders sampled are Christians and 4 out of 10; Moslem. Proportion of Christians to Moslems in Lagos is 7:3, Cross River; 10:0 and Kano 1:9.
- The average household size of the traders was found out to be 4.
- On the general, the average monthly household income of traders was determined to be N 71,633.
- Traders in Lagos have the highest household income (N 88,832), followed by Kano (N 73,994) and the least was Cross River state (N 47,815).
- Many of the traders (88%) reported saving part of their income regularly. The percentage was highest in Lagos (96%), followed by Kano (90%) and least in Cross River state (79%).
- When the traders were asked how they finance themselves in times of emergency (e.g sudden illness or death), 73% reported using their personal savings. The widely followed (16%) by 'ask for help or borrow money from relatives'.

Business Premise Assessment

- Overall, ownership of the place where the businesses are conducted is only about 25%.
- Traders generally use 8.50 m^2 area space for their business. Apparently, formal outlets have much larger area (11.09 m^2) to do business than the informal outlets (5.91 m^2).
- In assessing the number of hours traders operate, it was observed that trader generally trade for 11 hours, though with some slight differences among the different outlet types.
- 6 out of every 10 traders reported that access to electricity/power affect activities and/or trading hours. While this trend was generally similar, in Cross River only 5 out of 10 traders feel so. Same for informal outlets and outlets in the rural areas.
- The feedback from majority of the traders is that business patronage is low in the morning. This was reported by 48% of the traders. Most of the traders (54%) affirmed that business patronage is average in the afternoon, likewise evening (47% of the traders confirmed this). For the entire day, the report from majority of the traders (51%) is that business patronage is on the average.
- 13% of the traders each reported that difference in levels of patronage at different times of the day is due to opening of the market and customers' choice, wants, demands as well as request.
- For the entire day, a mean sale of N 16,547 was reported among all traders. It is worth mentioning that formal outlets make twice as much as informal outlets, Kano traders makes almost twice as much as Lagos traders, outlets in urban areas make practically twice as much as outlets in rural settings. However, this is on a general note and not product specific.
- Over half of the traders reported that their level of patronage for the last trading day is similar to other days in their store.
- Over half of the traders reported that availability of good lighting/ electricity play a role in determining the level of patronage at certain times of the day.
- It was reported by 62% of the traders that trading locations in urban region have laws governing their activities. 33% traders reported same in peri-urban and 33% in the rural region.
- Many traders in Lagos have issues with the market laws governing their activities as 73% of those who reported these laws said they restrict or limit their activities and/or trading hours.

Source of Power and Power Usage

- Overall, 62% of the traders surveyed are connected to the national electricity grid.
- More than three-quarter of the traders require electricity for their business.
- Generally, 94% of the traders who sell electrical appliances/electronics said they require electricity for their business. Same was reported by 85% of the traders who sell fresh foods, 80% of the traders selling other food products, 72% of the FMCG traders and 70% of the traders who sell clothes/shoes/bags.
- For services on the other hand, nearly all the hair dressers and barbers (98%) reported they require electricity. 89% of the tailors reported the same, likewise 75% of food vendors.
- Traders need minimum of 8 – 9 hours of electricity per day to keep the business running.
- Generally, on the last trading day, traders had 3 hours of light, as against the minimum required of 9 hours.
- Normally, the traders generally have electricity for 3 hours per day while Cross River has as low as 2 hours, Kano reported as high as 5 hours.
- Traders pay/expect to pay an average of N950 monthly for electricity (PHCN). This ranged from N100 to N8,000. This pay is not determined by the type of business.
- Traders feel they should pay higher for off-grid electricity than the national grid. The average pay for off-grid was determined as N 2,173, although this ranged from as low as N100 to N30,000.
- Distinctly, generators is what most of the traders (93%) have as off-grid power. Next to it with a very wide gap is solar (2%). 3 traders who sell FMCG goods, 1 fresh foods trader, 2 electrical appliances traders and 3 clothes/shoes/bags traders reported using using solar power.
- 4% of the traders have reported another source other than generators, solar or biofuel. This was reported especially by the Kano traders; they refer to Independent energy providers locally called '*maja*'.

- Sequel to the availability gap in the required electricity, traders generally use generators for about 6 hours in a day; 6 days in a week; average cost of fueling is N6,183 and average monthly cost maintenance is N1,378.
- Solar was reported to be used 7 hours a day and 7 days a week.
- More than half of the traders are willing to get connected to a new source or try an additional source of power.
- Many of the traders would like to be connected to solar as their first choice of alternative source of power. This was recorded more in formal outlets (65%), Cross River (68%), and among females (63%)
- As perceived by the traders, the average cost of getting connected to solar power source is N10,155 and the monthly running cost is N2,023.
- 4 out of every 10 traders are aware of generating electricity from solar energy.
- Only about a quarter of the traders are of the opinion that solar is easy to maintain.
- Many of the traders (83%) reported that they have access to a roof / another open space for solar panel.

Energy Usage

- Overall, more than three-quarter of the trader use energy for lightning, whereas only 13% need light for their core operations.

Energy Expenditure

- In the previous month, energy expenditure was highest on diesel; N 6,980 followed by petrol; N 6,429, Coal; N 2,680, firewood; N 1,723, electricity; N 1,570, kerosene; N1,521 and batteries; N470.

Use of Additional Electricity if it was available

- 'Requests from customers' (43%) was mostly reported as the factor that determines the range of product or service offered.
- 3 out of every 10 retailers reported that availability of electricity will bring a change to their trading hours.
- On the average about 65% of the traders will spend 1 – under 2 trading hours more if electricity were available. 72% of the traders In Lagos and 75% of the female traders will spend 1 – under 2 trading hours more if electricity were available.
- Generally, 4 out of every 10 traders are willing to pay for additional hours, irrespective of the type of outlet, state, gender or urbanization.
- While traders can afford to pay N828 monthly for off-grid power source if it will guarantee reliable power for an extra 4 hours per day, they are only willing to pay N621.
- If alternative source would guarantee reliable power for the whole day, traders are willing to pay N553, although they can afford as much as N732.
- About three-quarter of the traders currently pay for electricity from generator instalmentally (including daily/prepaid, monthly, pay as you use) and they will like to continue with this trend. This was recorded more in Cross River (90% and 92% respectively).
- 1 trader in Lagos pays currently for solar power installmentally while 2 traders in Kano pay upfront/bulk payment currently.
- However, there are some traders who will like to pay using recharge cards; Male traders (79%), traders in Kano (50%) and interestingly traders in the rural region (49%).

Access to Financial Services

- Only 15% of all the traders have access to mobile money services. More than a quarter of the traders in Lagos have access to mobile money. Surprisingly, only 2% of the traders in Kano reported access to mobile money services.

- Only one out of every 10 traders has borrowed money from a micro-finance organization irrespective of the outlet, location and gender. Kano recorded least in this regard; 4%.

- Among the traders who have bank accounts, 22% reported having access to credit facilities from their banks.

Communication channels

- Radio (42%) is reported to be the main source of information among all traders irrespective of their location, gender and outlet, followed by television (25%), mobile phones (25%), newpaper/other print media (6%), friends and family (3%). In Lagos however, television (40%) is the main source of information.

- More of the traders will like to receive information on ways to enhance their business mainly from the radio.

Abbreviations and Acronyms

DFID	- Department for International Development
IDIs	– In-Depth Interviews
GEMS	- Growth and Employment in States
M4P	- Making Markets work for the poor
Q	- Quarter
STREAM	– Strategic Research and Management

1. BACKGROUND

1.1 The Power Sector of Nigeria

In the 1950s and 1960s the Nigerian government created the Electricity Corporation of Nigeria to control all existing diesel/coal fired isolated power plants across the country and the Niger Dams Authority to develop hydroelectric power in Nigeria. These two entities were amalgamated into the National Electric Power Authority in 1972.

By the late 1990s it became clear that the publicly owned and operated electricity system was failing to meet Nigeria's power needs. The National Electric Power Policy of 2001 set the go-forward framework for power reform in Nigeria, leading to the National Electric Power Policy and thus the NIPP. (Bolanle Onagoruwa, 2011).

Currently, there are 23 grid-connected generating plants in operation in the Nigerian Electricity Supply Industry (NESI), with a total installed capacity of 10,396.0 MW and available capacity of 6,056 MW. Most generation is thermal based, with an installed capacity of 8,457.6 MW (81% of the total) and an available capacity of 4,996 MW (83% of the total). Hydropower from three major plants accounts for 1,938.4 MW of total installed capacity and an available capacity of 1,060 MW. (KPMG, 2013)

Electricity supply in Nigeria has been faced with a lot of challenges right from the days of the ECN (Electricity Corporation of Nigeria) to NEPA (Nigeria Electric Power Authority) and finally, PHCN (Power Holding Corporation of Nigeria). During the days of ECN, electricity supply depended mainly on coal, and there was adequate supply of this. With surplus income from petro-Naira in the early 70s, new hydro power plants were built to the neglect of the coal-fired power plants.

During the era of NEPA, the source of generation was hydro, with its own disadvantages. One of the major disadvantages of depending mainly on hydro power generation is the issue of seasonal rain that affects the volume of water available in the dams. As NEPA became PHCN, efforts were made to rapidly develop gas-fired power plants which are in vogue all over the world and which has its own advantages, considering the fact that Nigeria has abundance of natural gas.

With the privatization of power generation and distribution and with the Government largely retaining the transmission infrastructure, Nigerians have been expecting a tremendous improvement in the availability of power for both domestic and industrial consumption. Though the expectations of Nigerians have not been met in this regard, there are indications that such tangible and visible improvements are supposed to be gradual. According to the president of the Manufacturers Association of Nigeria (MAN), Chief Kola Jamodu, 40% of the production cost of manufacturers goes into the provision of electricity, compared to 5-10% in other similar economies.

In Africa at the moment, the alternative is now off-grid powers like solar power, generating set etc. The off-grid power sector is fast-growing and encompasses a wide spectrum of products and business models. In the field of lighting, the market for quality lighting products has matured even more rapidly than predicted. The number of Pico-powered lighting systems (PLSs) products has increased to more than 300,000 and new technologies have been introduced to improve functionality (e.g. brighter light) and affordability. Costs and prices have fallen and the number of companies active in the market has risen from 10 in 2007 to 80 by 2013.

1.2 Introduction

The Growth and Employment in States (GEMS) programme, a joint initiative of DFID, the World Bank and the Federal Government of Nigeria facilitates improvements in the performance and inclusiveness of the wholesale and retail sector. It is targeted at improving income and employment opportunities within Nigeria's wholesale and retail sector, particularly for the poorest and most vulnerable.

The project as a whole works to build local capacities and change market incentives so that the sector better meets the long-term needs of the poor across Lagos, Kano, Cross River states. The Off-Grid Power (OGP) intervention will focus on the Nigerian retail sector. It will focus on the business needs of the sector for OGP and the potential opportunities for its use, to develop more efficient and effective working, better quality products and services, broader range and mix of products and services and other economic benefits as well which translate into improved incomes, firm growth and employment.

1.3 Overall objective

The purpose of the market survey is to assess the size of the market demand for Off-grid power by the retail sector in Nigeria. It also seeks to quantify and assess the size of the market opportunity as well as commercial viability of this sector to private sector Off-grid energy solution providers who might be interested in investing in this sector.

1.4 Research Objectives

Specifically, this baseline study seeks to:

- To support GEMS4's understanding of the energy needs of retail businesses in the sector.
- To identify and document evidences of the negative effects of limited access to alternative energy solutions for businesses in the Retail sector.
- To determine the availability and affordability of solar energy power sources to businesses, especially SMEs, engaged in the Wholesale and Retail sector.
- To identify the principal market system constraints impacting on access to low cost energy sources including solar powered off grid solutions for market actors, especially the poor, in the wholesale and retail sector of Nigeria.
- To ascertain how GEMS4 can best unlock these constraints, and how interventions can be mobilized to support development and deployment of market solutions.
- To lay the evidential foundation required to stimulate private sector investment and delivery of solar energy Off-grid power solutions to the retail sector.

1.5 Project Scope

The following tasks will be undertaken under this assignment:

- capture social demographics (age, sex, family size etc.) of the respondents as well as their business profile (number of staffs, type of business, and etc)
- Provide comprehensive contact details of respondents
- Provide details on the goods/products traders sell;
- customers that buy which goods – pattern of purchases
- volume of goods sold at different times
- What defines/limits the range of goods and to what extent is the availability of power a factor
- What products could additionally be offered if power constraints were removed (e.g. mobile phone recharging, TV sales)
- Trading revenues by time of day (footfall increases early morning/late evening – when it is also dark
- How retailers finance the energy expenditure, (from cash flow, working capital, loans from friends, FI's? Access to finance for trade and alternative power source
- Percentage of total revenue/expenditure spent on energy products
- Measures of WTP (Willingness to pay) for extended trading hours
- Payment preference for power solutions
- Disposition to using solar powered products vs generators
- Minimal energy requirements to keep the business running
- Determine the availability and affordability of solar energy power sources to businesses
- To identify the principal market system constraints impacting on access to low cost energy sources
- Current level of access to mobile money services
- Current level of access to an MFI (if pay as you go is not possible)
- Current level of access to other forms of financial service

2. METHODOLOGY

2.1 Study Design

The overall survey design for this baseline study is a cross-sectional approach that adopted a combination of qualitative and quantitative approaches.

Two groups of key stakeholders were identified and involved in this study:

(i) Market traders (retailers of FMCG products, hairdressing outfits, outdoor eateries, tailoring outfits, health shops/small pharmacies, boutiques/apparel/shoe shops etc.)
(ii) Members of market associations, market authorities, regulatory bodies (energy board and ministry of environment), existing energy providers (On-grid, Off-grid and independent energy providers).

The methods used include:

(i) Survey
(ii) In-depth Interviews (IDIs)

	Stakeholders	Description	Research method	
			Quantitative	Qualitative
1	Market traders	Retailers of FMCG products, hairdressing outfits, outdoor eateries, tailoring outfits, health shops/small pharmacies, boutiques/apparel/shoe shops	Face to Face, Mobile Data Survey	
2	Members of market associations, market authorities, regulatory bodies, existing energy providers.			In-depth Interview (IDI)

2.2 Study Sites & Sample Size

Study sites are:

(i) Lagos State	(ii) Cross-River State	(iii) Kano State

In order to cover sufficient sample of the target population, 702 traders and 67 members of market associations, regulatory bodies and existing energy providers were reached across the three states (Lagos, Cross-River and Kano states).

Sample Size Distribution of the small-scale formal and informal retail units across the study zones

Retail Unit Type	**Lagos**			
	Urban	**Peri-urban**	**Rural**	**Total**
Formal (lock-up shops)	27	54	36	117
Informal (kiosks, mom & pop shops, etc.)	27	54	36	117
Total	**54**	**108**	**72**	**234**
	Kano			
Formal (lock-up shops)	27	54	36	117
Informal (kiosks, mom & pop shops, etc.)	27	54	36	117
Total	**54**	**108**	**72**	**234**
	Cross River			
Formal (lock-up shops)	27	54	36	117
Informal (kiosks, mom & pop shops, etc.)	27	54	36	117
Total	**54**	**108**	**72**	**234**

Retail Unit	Lagos					
	Urban		**Peri-urban**		**Rural**	
Formal	-Idumota market -Dosunmu market		-Sabo Market,Yaba -Ogba market -Alaba Int'l market -Computer village		- Ayangburen market, Ikorodu Central. - Ajaguro market Owutu, Ikorodu West.	
Informal	-Oke-arin market -Balogun market		-Oke odo market -Mushin market -Alaba Ijora – Badia -Anjorin Akure street Apapa		- Round About Int'l market - Daily Market Seme Border	

Retail Unit	Cross-River					
	Urban		**Peri-urban**		**Rural**	
Formal	-Watt market		Ikom Central Market Ishibori Market Igoli Okuku Market		Adim Market Iwuru Market	
Informal	-Marian market		Okuku Market Uyanga Market Okurikang Market		Apiapum Market Edor Market	

Retail Unit	Kano					
	Urban		**Peri-urban**		**Rural**	
Formal	- Abubakar Rimi market		Talatar Kanya Dawanau Market Kunchi Market		Garo Market Kabo Market	
Informal	- Kwari market		Sabon Garin Doguwa Tiga Market Yada Kwari Market		Kiru Kasuwa Laraba Dansarki	

SAMPLING TECHNIQUE FOR THE SMALL-SCALE FORMAL AND INFORMAL RETAIL UNITS (QUANTITATIVE)

1. **Purposive Sampling Technique,** a non-probability sampling method was used for this study.

2. **Classification of LGA by urbanisation**: All the Local Government Areas (LGAs) in each of the states were listed and categorised by urbanisation following categorization of the State Ministry of Rural Development.

3. **List of all the markets** in all the local governments in the states were generated from secondary data, state market associations and other relevant bodies.

4. **Classification of Market by urbanisation:** Markets were classified by urbanisation (urban, peri-urban and rural) of the LGA.

5. **Selection of Market:** Selection of the market included in the study was by purposive sampling. The markets were chosen based on the size of the market (big and major markets were selected), the type of structure (formal /in-formal) present there so they can be relevant to the study and the intervention. The types of goods or products sold at the markets were also put into consideration.

6. (i) The entire market was mapped in order to identify its boundaries.

   (ii) The market was then sectioned into 4 quadrants. The aim was to spread interviews across the different parts of the market and ensure to sample all the different categories of traders in the market.

   (iii) As much as possible, interviews were spread over the four quadrants of the market.

   (iv) Sampling within each of the quadrant was by **Purposive sampling**, in order to capture all the categories of traders in the markets.

   Note: Mapping and sectioning of the market was done before the day of the fieldwork, likewise identifying the different categories of traders. Considering that this is a non-probability technique, Research Executives, Field Managers and Supervisors actively guided in doing this.

Source and Definition of Classification of Markets

Lagos State Digest of statistics; Lagos State Ministry of Rural Development. Table 3.11 on Page 73 of the 2011.

Markets in LGAs with no rural and less Semi-urban communities were classified as 'Urban' while markets in LGAs with more rural communities were classified as 'Rural'. The final selected markets can be found in the 'Urban', 'Semi-Urban' and 'Rural' communities of the selected LGAs.

Table 2.2.1: Sample size Distribution

Stakeholders	Lagos		Cross-River		Kano	
	Quantitative	Qualitative	Quantitative	Qualitative	Quantitative	Qualitative
Market traders	234		234		234	
Market Association	-	11 IDIs		11 IDIs		8 IDIs
Market Authority		4 IDIs		4 IDIs		4 IDIs
Regulatory Bodies (Energy Board)		1 IDI		1 IDI		1 IDI
Regulatory Bodies (Min of Environment)		1 IDI		1 IDI		1 IDI
On-Grid Energy Provider		2 IDIs		2 IDIs		2 IDIs
Off-Grid Energy Provider		2 IDIs		2 IDIs		2 IDIs
Independent Energy Provider	-	1 IDI		1 IDI		5 IDI
	234	**22 IDIs**	**234**	**22 IDIs**	**234**	**23 IDIs**

Description of Retail Unit Type and OGP

Kiosk

A small (usually about 3m x 3m), portable standalone building constructed from wood, lightweight prefabricated panels or mild steel metals. Specializing in the sale of one product (e.g. charge cards) or a mixed category of products (e.g. food and beverages, personal care products, etc.). Flexible opening hours dependent on the location and customer activity.

Lock up Shops

One small room (usually about 5m x 5m) for retail located within a terrace or multi-storey building of other lock-up shops. Clusters of lock-up shops within each block or the block in its entirety may retail items for a particular sector (e.g. building materials, Apparel, Fresh food, electrical) or multiple sectors. Usually with fixed opening times depending upon the formality of the set up.



2.3 Qualitative Approach

Qualitative research technique was employed In order to promote participatory research process among the stakeholders and provide an in-depth understanding of the general perception on the subject matter. This included In-depth interviews (IDI) for the members of market associations, regulatory bodies and existing energy providers.

In-depth Interviews among Members of market associations, regulatory bodies and existing energy providers

This was conducted among members of market associations, regulatory bodies and existing energy providers between 3rd November and 15th November 2014. The essence of this was to collect information required to understand the power needs of retailers and quantifying the financial opportunities for energy providers. The interviews were conducted across the three states (Lagos, Cross-River and Kano). Audio recording of the IDIs was carried out using our digital recorders.

Market Elder (Association) in Ishibori Market, Cross-River

2.4 Quantitative Approach

Formal outlet in Ishibori Market, Cross-River

Quantitative data was collected using fully structured questionnaires that were administered face to face, with Mobile tablets. The interviews were conducted in market outlets; this lasted between 3rd November and 15th November 2014. The survey per respondent lasted about 30 – 45 minutes. Key indicators measured include information on types of products/services, source of power, energy usage, energy expenditure, sales, income, etc. Also, socio-demographic information such as age, gender, etc, from the traders was also collected through this approach.

2.5 Recruitment and Training of Field Staff

Cross section of training in Lagos

Training of field staff was done on the 30th – 31st October, 2014 in Lagos. 3rd – 4th November, 2014 and 4th – 5th November, 2014 in Calabar and Kano respectively. STREAM Insight used interviewers and supervisors in each state. In addition, Project coordinator/consultant was present in each state during the fieldwork.

More interviewers than needed were recruited and trained for the study. This allowed us to select team members on competence and availed us the opportunity to make easy replacements if a selected team member has to leave the team before the end of the fieldwork.

2.6 Questionnaire/Survey Tool

GEMS4 designed the questionnaires for the survey, which was reviewed by STREAM Insight. STREAM Insight designed the interview guides for the IDIs, with input from GEMS4. The questionnaires and guides which were approved by GEMS4 was designed in English language, and translated into Pidgin, Yoruba and Hausa for easy adaptation at different study areas considering the literacy level of the respondents. These were then back-translated to English language by different translators to ensure perfect translation. See appendix for the samples of the survey tool.

2.7 Language of interviews

All the interviewers were indigenes of the states and spoke the local dialects fluently. Hence the language of the interviews was local dialects in many of the cases and English in some cases. Interviewers were equipped with the translated copies of the questionnaires. Since all enumerators were hired from the local communities of the survey, language barriers were not a problem.

Upon contact with the beneficiaries, the interviewers/ moderators explained the study and its purpose. An affirmative response indicated interview to continue, otherwise the enumerators/ moderators thanked the respondent and terminated the interview.

2.8 Pilot Survey

Prior to the commencement of the main survey, the questionnaires were pre-tested on the 31st October, 2014 at Oshodi Market in Lagos state. All the translated versions of the questionnaire were also piloted.

2.9 Quality Control

Throughout the study, strict quality control was implemented. All personnel involved were properly briefed and trained. Moderators/enumerators were well supervised with back-checking and on-spot checking where feasible. The translations were verified by the expert translators and any error observed was duly corrected. Proper back-translations were done to avoid misinterpretation of data. Interview guides were used during translations.

2.10 Ethical Consideration

Ethical consideration was given a vital role in this study. As part of ethical consideration for human subjects, participation in the study was voluntary. The participants were enlightened on the purpose, procedure and end- benefit of the study before the interviews. Verbal consent was obtained from all respondents before they were allowed to participate in the process. All responses and opinions were accorded due regards.

2.11 Analysis

In-depth Interviews (IDIs)

Responses were documented using digital recording devices and simple note taking. After completion of interviews, the translations of the information collected was carried out in each location by the interview moderators, assisted by experienced translators. The moderators were engaged as they will be able to recall events and present the conversations with a high level of accuracy. The purpose of the expert translators was to ensure data validity and quality report output. The responses generated from the interviews were analysed using a mixed method approach of content and case study analyses. The content analysis involves identifying similar themes as outlined in the interview guides, to draw a general context from the responses. The translated information was aggregated into Microsoft Excel sheet to aid coding and analysis. Observations were disaggregated by location and groups.

Throughout this report, anonymity of the respondents was maintained while remaining true to the central issues highlighted and the insights learned from their core experiences. Names were represented by letters derived from the true names of the respondents. Key observations were highlighted, either in box or underlined. Direct quotes of respondents were included wherever necessary.

2.12 Data Processing and Analysis

After fieldwork and field validation, questionnaires were synchronized; uploaded to the database server of STREAM Insight. Quota, and specification were checked for validation.

The editing and coding team checked for accurate compliance with skip patterns. This unit also developed standard coding frame for the open-ended responses. This list was passed to the data analyst for approval.

A standard data template was developed by the Data Analyst, which was validated and approved by the Data manager. The data set was transferred to STATA Statistical software package for consistency checks and preparation for analysis. Final analysis was done using IBM SPSS Statistics Software.

2.13 Challenges

1. Some of the respondents were not willing to disclose information on their business, especially as regards sales and income.

2. Many of the respondents complained severely about the lengthy nature of the questionnaire. A high refusal rate to complete the interviews was recorded. This was a major challenge.

3. Some of the markets were very far apart from each other. Travelling to some markets as far as 7 hours travelling distance was a challenge on logistics.

4. Some markets had trading days. This was also a challenge, as the itinerary had to be revised to meet up with their market days.

5. Getting authorization from the market leaders in some markets was a challenge.

6. For the IDIs, due to the corporate nature of the interviews and the nature of the questions, many of the respondents were initially skeptical to cooperate in fear for the safety of their jobs.

3. DETAILED FINDINGS

In-depth Interviews (IDIs)

A. Market Associations and Authorities

The heads of market associations and authorities are responsible for creating, implementing and enforcing some of the laws and policies that hold within the markets and its various constituent associations. They demonstrated a good level of knowledge of the power and electricity needs of the markets which they preside over. They were able to provide information on the source of energy and usage in the markets with respect to the preferences of the trader to either the national electricity power source or alternative energy sources and reasons for their preference. They talked about the effect of the availability of electricity on the business trading hours as well as trading activities, the cost of procuring and running alternative sources of energy, and the safety of the specified alternative sources within the market (for those who are allowed to keep their alternative energy sources within the market). Lastly the heads of associations were very instrumental in providing information on the laws that govern the market and its effect on power usage.

Generally there are laws in most of these markets that insist on the number days for trading activities as well as the time these markets are opened and shut down on their trading days. In most of these markets, majority of the traders are connected to national electricity however they make use of the alternative sources more because of the inconsistency of the national electricity grid. They also complained about how expensive using these alternative sources were except those in Kano who make use of an alternative source call the maja (independent energy provider) and they pay a relatively small sum of money for it.

The heads of the associations reported that there is a direct relationship between the availability of electricity and the trading hours affirming that trading hours is dependent on their access to electricity. Most of them were aware of solar energy and ascertain that there are available roofs and locations within these markets to erect the solar panels. They also asserted the fact that the markets are safe enough with security in place, to erect the solar panel infrastructures with little or no issues of theft and damages given that some of them leave their generating sets in the market and have not encountered any challenges to that effect. There are laws governing these markets/trading locations however except in Cross River state, these laws do not restrict the use of alternative sources of energy.

Background Information of Market Associations and Authorities

The executive members of associations and authorities of selected markets across the three locations of study were sampled. In Calabar, these markets are Marian, Iwuru, Okurikang, Uyanga, Watt, Okuku, Ikom, and Ishibori. In Lagos; Computer village, Seme border, Ogba, Sabo, Oja-oba in Ketu, Ile-Epo, Ojota, Dosunmu, Idumota, Balogun, and Round about Intl and Alaba International markets. Three markets were sampled in Kano, viz; Abubakar Rimi (also known as Sabon-geri), Yankura and Tarauni.

Table 2: Market associations membership	
# of members in selected associations	**Market/Location**
about 200	Watt, Calabar
Over 250	Okuku, Calabar
500	Sabo, Lagos
3,000	Computer village, Lagos
300	Oja-oba, Ketu
Over 2,000	Ile-Epo
400	Ojota
750	Tarauni
3,000	Abubakar Rimi

For best responses as much as possible, the following category of stakeholders were sampled; presidents of market union and associations, Chairmen and Vice-Chairman of market union/authority, market manager, market women leaders, secretaries of associations/markets, section heads, chairmen of sections and associations, elder in the market, head of ticket section, Iyaloja/iyabode (female head of markets), chief whip, Public relation officers, treasurer to association, as well as other executive members of markets, many of whom are traders.

Many of them have been members of one or more market associations/authorities for many years; some ten years and more, some for less than 10 years.

These associations have members, all who are also traders in the markets. Some have membership less than a hundred, while some have between 200 to 500 and some as high as 2,000 to 3,000 members. The summary of membership of selected markets in the different study locations is presented in table 2. However, it should be noted that some of the sampled executives are only heads of sections or specific associations, some small and some large. As a result the numbers of membership does not necessarily represent the total number of traders in these markets.

SOURCE OF ENERGY AND ENERGY USAGE

Market activities/operation

How many days per week do traders in this market trade/operate?

Business activities in terms of the number of days traders operate weekly in the markets visited varies, depending on the market and location. Some markets have business activities every day in the week, Mondays through Sundays. These include: the Ogba market, Oja-oba, Ketu, Seme, Ile-Epo and Sabo markets in Lagos; as well as the Yankura, Sabon-geri (Abubakar-Rimi) and Tarauni markets in Kano. In fact, all the markets visited in Kano have business activities every day. The Ikom market in Calabar also exhibit a similar pattern, except that Sundays are not busy with market activities compared to the other days, although it is considered a market day.

> *"The traders come every day, including weekends. Market opens from 6:30 am to 8:00pm."*
>
> - Member of Association, Yankura Market

Some markets only allow business activities six days a week, except Sundays which is either considered a non-market day or at best only used for informal activities such as carrying out some repair works, etc. Such are the computer village, Ojota, Round-about International, Dosunmu and Alaba International Markets in Lagos, and the Marian and Watt markets in Calabar.

Apart from Lagos and Kano with the minimum of six days for business operations, Calabar is somewhat different. In markets such as the Uyanga and Iwuru markets, traders operate mainly two times weekly; precisely only on Tuesdays and Fridays and Mondays and Thursdays respectively. The Okurikang market is opened for market activities two times a week, every four days. In the Okuku market, there are two main market days when traders from different communities and local government areas come to do their businesses; however the members of the community run daily markets for petty trading. The Ishibori market in Ogoja (Calabar) is slightly different in that 'traders trade essentially only every 5 days for the main market days while the daily market is not always a busy one.'

What time does this market operate? Inquire about the opening time and closing time, weekend operations and periods of inactiveness e.g. sanitation period and others

"(Market) opens 7am to close 6:30pm - 7pm. There are people paid to do sanitation monthly, so the market is not closed for that. Days we close from 7am to latest 11am are days we want to have general meeting when all members of the union gather together. Others that are not members can not open as well as their goods will be seized. Everybody gets to obey the closure so it shows we are in one accord." - Mrs. A., Marian Market, Calabar.

The time of market opening and closing also varies per market in the various locations of study. Generally, across the various locations, most markets are opened for business activities between 5 and 6am in the morning and are closed between 5 and 7pm in the evenings, on typical market days, weekend inclusive.

However, comparing observations in specific locations; about all the markets in Kano have their business activities between 7:00am – 7:00pm. In Watt market in Calabar, business resumes 'whenever anybody comes to open his shop, from like 6am. People close at anytime they choose to. There is no law controlling time to open and close.' Similarly, the Okuku market in Calabar opens as early as 5am and operates through the night, 24 hours on some days. In Lagos, according to the secretary of one of the associations in Lagos, there are no specific opening and closing times. The same obtains for Ile-Epo and Dosunmu markets; however major activities would have waned by 9pm.

Table 3. Markets opening and closing days

Days of market activities	Market	Market opening & closing periods of inactiveness
Every day in a week	Ogba, Oja-oba, Ketu, Seme, Ile-Epo & Sabo markets (Lagos). Yankura, Sabon-geri (Abubakar-Rimi), and Tarauni (Kano). Ikom (Calabar)	- 7:00am – 7:00pm in most locations - It ranges between 5/6am – 8/9pm **Sanitations:** Thursday, 7-10:00am in Lagos Fridays or last Saturdays/month in other locations **Meeting** Mondays/Tuesdays for (mostly in the morning).
6 days in a week apart from Sunday.	Computer village, Ojota, Round About Intl mkt., Dosunmu, Alaba Intl. Market (Lagos)	

Generally, the periods of inactiveness basically affect business functions for some hours or about the entire day or days, depending on the event. According to the participants such periods include market sanitations, market associations meetings, government (at all level – federal, state or local) declared events that necessarily include market closure, holidays such as Christmas and new year days celebrations (which could be voluntary), and during special circumstances such as closing the market for traders to register for/collect voters' card (an example was in Marian market in Calabar).

The most common of all these is sanitation exercise, which was observed to be compulsory in some markets. Sanitation is compulsory in all the markets in Lagos and usually up till 10am every Thursday. There is no market activity during this period as there are strict fines on any trading outlet that do not observe this exercise. It appears that this may not be so for markets in other location, such that business activities are not halted. In some markets in Calabar; Watt, Marian, Iwuru, Ishibori, and others have their sanitation exercise outsourced such that it does not disturb their businesses at all. However, Ikom markets have strict sanitation exercise and general meeting usually around the last Saturdays of the month, between 7am to 12 noon. In Kano, sanitation is sometimes every Friday or the last Saturday of every month, especially at Sabon-geri market.

Availability and Use of National Power/On-Grid

Do traders use national electricity power source (PHCN) and/or alternative power in this market? Which do they use more and why?

Generally, traders in many of these markets use both the national electricity power source (PHCN) and alternative power source. Markets where both power sources are used include; Marian, Ikom, and the Ishibori markets in Calabar and the Computer village, Ogba, Sabo, Dosunmu, Ojota, Round About and Alaba International markets in Lagos, as well as Sabon-geri market in Kano. In all these markets, except at the Alaba International market in Lagos, the power generating set is used more due to lack of regular national power supply. The Alaba International market claim they use the PHCN more as they do have regular power supply.

> "It (PHCN) is not at all available. We don't use to see it; maybe we see it once in 3 months. We don't know now, it is government property."
>
> - Mrs. CU, leader of a women group, Sabon-geri, Kano

In terms of availability, the market authority/association executives believe the alternative power (mainly generating set) is much more available than the main grid electricity. These markets rarely receive daily regular power supply from the national electricity source (PHCN), and sometimes it may be weeks or months. According to a market authority at the Ikom market, *"It is about 2 to 3 hours and maybe like 2 days in a week and sometimes 3 times in a month. They give us light when they are about to bring the bill."* The situation is slightly better at the Oja-Oba market in Lagos, due to the availability of power transformer and its proximity to the market as pointed out by the market leader; *"There is PHCN transformer beside the market, very close to the market and we have at least six hours or seven hours PHCN power every day."*

In some of the market, traders use alternative power only. Markets such as the Okuku, Iwuru and Uyanga markets in Calabar as well as the Seme border markets in Lagos have never had PHCN power supply. On the other hand the Watt market though connected, power supply has been unavailable for over a year. On a slightly different observation, the market leader of the Oja-oba, Ketu market claimed they only use PHCN, but not alternative power.

> *"…we use maja (independent energy provider) or generating set. We use maja because it is easier, cheap and convenient to use, we pay N100 per day, the power is from 9:00am – 6:00pm."*
>
> - Public Relations Officer of a traders Association in Kano

Some markets also use a central generating set to supply power to many businesses within the market. Alaba international uses such model. A similar model is the 'maja' used as the most reliable alternative source of power for all the sampled markets in Kano. From observations, traders have a preference for alternative power because of lack of constant electric power supply,

and the poor services as well as 'outrageous charges by PHCN, which makes it 'unreliable in Nigeria anymore'. In contrast, the alternative energy is readily available for people to use, expenses 'depends on ones pocket' and it is easier, cheap and convenient to use.

What are the challenges mitigating against on-grid power source?

According to the traders, the challenges facing on-grid power source are collectively perceived as inefficiencies in the systems that is from the providers and regulators, without an exception of the government. These problems include the provision of poor services such as low voltage and the continuous collection of service charge even when power was never or poorly supplied. These have resulted to low consumer confidence or trust in the national power. As one trader in Calabar suggested, *"PHCN is not reliable..."*

Access to energy and effect on business (Market/traders demand for On-Grid power)

What do the traders in this market use energy for?

Generally, the traders in the different markets use energy to promote their businesses, depending on business types and tools. Overall, they use power to ensure good service delivery. Specifically, to power machines such as refrigerator for cooling of drinks, water, iced block and preservation of perishable goods such as frozen foods; lightening parking store, and warehouse; for laundry and ironing; to charge phones, especially those who engage in such businesses; for hair making, and tailoring; for systems like computer for counting purposes, light for lightening offices, for display of goods to attract customers and fan for aeration; as well as for general pleasure; individual and clients' entertainment.

Building a case study on the use of energy by a hairdresser in the retail market, Mrs. C.U, the leader of a market association in Sabon-geri, stated that energy is used in the salon to power the hair dryer, hair blower, and the hair stretcher. She explained, "And you know we use the clipper nowadays, if we want to fix this short Rihanna (a type of hair style) we use the clipper to clip it. And again we put on music for the customers, or movies to entertain customers and make them busy. Again energy is used for lightening to beautify the shop, and to charge phones.'

> *'The lack of reliable power supply affects businesses in such a way that it makes business activities dull and profits are expended on purchasing gasoline for generating set and maintenance, and the fumes from the generator are harmful to health and the environment.'*
>
> – Mr. B.O, association executive member, Round-About Intl. market, Lagos.

Does access to energy limit the trading activities and/or trading hours in this market? If yes, in what way?

About all the market association and authority members interviewed confirmed that the lack of reliable power supply limits the trading activities and/or trading hours in this market. Generally this is true in all markets; however when the source of energy is considered as either from national supply or alternative, this observation was found to be more in markets in Lagos and Calabar than in Kano. About all the markets in Kano depend largely on alternative energy which is readily available whenever needed, ditto for the Seme market in Lagos as well as the Marian and Iwuru markets in Calabar. The absence or poor access to energy affect quality of services as customers may not get services as when due, profit margin are reduced due to loss of some goods to spoilage and increase in cost of running business due to more consumption of fuel to power generator, businesses are also forced to close early as a result of poor sales.

The single most used alternative energy source in about all the market is the power generating set. It is considered to be readily available and affordable for any trader, since they come in different sizes and prices.

When asked 'Like how many hours of power are needed to keep business running and why?' the markets leaders in Lagos and Calabar responded that an average of 10 hours (often between opening and closing hours) is good to keep business running, although 12-24 hours is preferred. Markets in Kano would be fine with eight hours or ten at most. Besides other reasons such as to keep their products fresh especially throughout the night, to create lightening to attract customers, make them comfortable and ensure quality services are provided, power is used for lightening the market for security at night.

Alternative Source Demand Driven alternative power

What are the types of alternative power sources available and which they use more?

The single most used alternative energy source in about all the market is the power generating set. It is considered available and affordable for any trader, since they come in different sizes and prices. It also meets quick needs. Strictly, only in some markets in the two of the three locations of study were other alternative sources of power used; inverter (computer village, Lagos), and Solar (Alaba Intl., Lagos). The maja is common in markets in Kano. Generally, power generating set is available in the different market, except in markets such as the Oja-Oba and Round-about International markets where power generating are not allowed.

What is the cost of running alternative power? How do traders perceive the affordability of alternative power and their views about maintenance?

> *"It (the use of generator as an alternative power source) is very expensive considering a litre of fuel is N100, and powering it for the whole day is high. If there is alternative power that is affordable, we will embrace it."*
>
> – Mr. T.A., head of a unit, Ikom market

The cost of running alternative power include but not limited to the following: the huge amount spent on fuel (gasoline) which ranges between N5,000 to N90,000 monthly (for markets in Lagos and Calabar) or as low as N3,000 for markets in the North (because they use maja), depending on the type and rate used; the continuous increase in the price of purchasing generator due to increase demand (e.g. a small set of N12,000 now sells for N16,000 – N20,000); the high cost of maintenance, and the noise pollution. The amount spent on maintenance affect the profit margin of the business owners. See page 44 for more information on the cost of maintenance (under the sub-heading energy expenditure). When compared to the cost of using nationally supplied power, generally, traders think using off-grid power sources is costlier. However, due to lack of regular on-grid power, they are constrained to use alternative sources, especially power generating set. It is important to reiterate here that the major alternative source of power traders described here is the power generating set, which is available in various sizes and cost.

Demand Driven alternative power

If power were available all the time how would it change business in this market?

From the perspectives of the markets authority and associations, if power were available all the time in the market, the impact will be far reaching on businesses. The availability of power makes traders stock up goods and expand their businesses as they are assured of less spoilage of goods, regular patronage from customers and increased sales. Some believe that traders may be encouraged to stay longer in the market and 'everybody will operate fully'. There will be reduction in the cost of running business as they will spend less on fuel consumption to power generating sets. An added benefit of regular power is that there is a possibility of employment opportunities, as businesses need to increase their workforce. More traders will also use the market to promote their goods/services. One of the respondents summarized it thus; *"If there is power, people will be more productive it will affect the price of goods and services positively."*

What products/services could additionally be offered if power constraints were removed?

"There will be more of cold rooms and no more scarcity of some goods, more so that this market is for household items and food items. There could be production of textile too." Marian market – Mr. M.E, executive member of market authority, Marian market

Traders can expand their businesses if power constraints were removed. The likely additions include: textile and other manufacturing businesses, cold rooms/storage facilities, creation of vocational centres for phone and computer repairs, cosmetic business

The availability of regular power in markets will bring about expansion and create additional products/services, some of which include: establishment of textile business and other manufacturing hub at the Marian market, cold rooms/storage facilities in many other markets, notably Okuku and Ikom in Calabar; more people will start frozen food and production of iced block at the Round-about Intl. market; sale of alcoholic/non-alcoholic drinks businesses in many of the market as well as the 'buying and selling of film and audio cassette' at the Seme border market. There will be influx of youths who repair phones at computer village, and the creation of youth vocational centre (for phone and computer repair) in Sabon-geri market, also the creation of a cosmetics business centre in the same market.

Solar power: knowledge and demand

Are you aware of solar energy for generating electricity? Do you know how much it costs to set it up? Do you know how much it costs to run it? What do you think of its reliability and ease of maintenance? Are roofs or other open locations available for solar panels in this market?

"I am aware but don't know about the setting up and running cost. We will be happy if it is made available for us."

- Mr. S.L., Market Manager, Iwuru market, Calabar

Generally, there is a good level of awareness of the solar energy, but much is not known of the costs of set-up and running, ease of maintenance and reliability. All the fifteen market associations /authorities members in Calabar except two (in Marian and Uyanga markets) are aware of solar energy, but none of them know the cost of set up nor how much it costs to run it, and only one of them (at Ikom market) think it will be reliable though not sure about the ease of maintenance. Similarly, four (Round-about, Ile-epo, Oja-Oba Ketu and Seme border markets) of the market associations' members in Lagos are not aware of solar energy, though some claimed they have some knowledge of the cost of set up and maintenance. The same observation was made in Kano, where all except the participant at Yankura was not aware of the solar energy. Given the level of awareness and being a new technology to some, some of the participants expressed some doubts about the use of solar energy in terms of the longevity, reliability, costs, and the possibility of theft.

On a positive note, all except one (Dosunmu market) of the market authorities/associations member said there are roofs or other open locations available for the installation of solar panels in the markets. Also, some expressed the optimism of having this alternative energy in the market.

What do you think about solar power for this market? (Compared with generators) Why? Would you use it?

Overall, there is preference for solar energy as an alternative source of power in the markets when compared to the use of generator. Specifically, all the market leaders in Calabar, and all but one in Lagos and Kano, expressed delight at having this alternative form of energy in their markets. Citing lack of awareness, very few of them expressed doubt, such as the capacity of solar energy to power electric motors, carry high powered electric appliances. Despite some of the pessimism, all the market leaders confirmed they will use solar energy if presented as a viable and affordable alternative source of power. Other reasons for the preference are that the solar energy package does not produce noise, and that generator produces too much fumes that is dangerous to health.

Overall, there is preference for solar energy as an alternative source of power in the markets when compared to the use of generator.

The perceptions of the market leaders have been summarised in the following quotes: *"Solar is preferable in this market, since we do not allow generating set and it does not use petrol and diesel that will burn down the market."* (Oja-Oba, Ketu); *"Removing the cost of maintenance, solar energy will be good, it will be more secured, soundless, and smokeless; it will be very good."* (Sabon-geri, Kano); *"It is a welcome development that the people will appreciate because it will serve us better than our generator and the maintenance will not be a daily thing like that of generator."* (Okuku market, Calabar).

To foster the acceptability of solar power in the market, some of the market leaders requested for awareness and education of their members on the importance of solar energy for business.

Market safety

If solar panels were installed on the roofs or other open spaces in this market, would they be secure? How secure are the goods kept permanently in shops and stores in this market?

In terms of safety of the solar panel, there would be no security issue. Data evidence from the market executives suggest that if installed, the solar panels will be very safe as there are paid security personnel that guard the market. This was supported by the evidence that goods kept permanently in shops and stores in the markets are always secured. However, for some markets such as the Uyanga market in Calabar, 'traders do not keep goods permanently because it is only opened twice a week'.

On the enquiry of generators kept in the market premises and if traders in the market face any security challenges with their generating sets, the general response was that generators kept in the market premises are safe, although there is a possibility of theft; it is not major security challenge in any way. Although the section head of Ikom market Calabar admitted there are some security challenges, he did not identify any except that there is no fence around the market. Some traders take their generating sets home for use every day and bring them to the market the following business day, though this is not to necessarily mean there are security challenges with the markets.

Market laws; a success factor for alternative power demand and use

Are there market laws governing this market? Do these laws restrict the use of alternative power sources such as generators (and others) in this market? If yes, in what ways?

The markets are governed by laws. According to the market executives there are laws governing each of the market, but these laws do not restrict the use of alternative power sources, such as generating set, except the Oja-Oba, Ketu and Round-about Intl markets in Lagos, where no trader is allowed to use power generator or any alternative power source that use petrol or diesel to avoid fire outbreak. These laws are not enforced so long the alternative power source does not use petrol or diesel, such as the solar energy.

Although these laws do not restrict the use of generator or other alternative sources of power, they guide how they must be used. Some markets do not allow traders to refuel/adding of gasoline into the fuel tank while they are on. Also, generators must not be locked inside the shop overnight with the tank filled with fuel, it must be emptied. All traders must ensure proper maintenance of generators so that air and noise pollution can be minimized. Similarly, exhaust pipes of the generators must be passed through a longer pipe to channel the smoke of generators up to the sky.

The market executive at the Round-about Intl market however suggested there is need to make advocacy visit to the local government authority as they are one of (if not) the best entry point to the market since they have more control of the market.

B. ENERGY PROVIDERS: OFF-GRID

Background Information of energy providers

Six off-grid energy providers, two from each state, were interviewed in the course of gathering information and opinion of the energy needs in the retail sector.

The respondents are Mr. Pet and Mr. O.E who are providers of solar infrastructures in Cross River; Mr. B.A, a provider of solar energy and generating sets as well as Mr. F.A, a manager of an energy and technology Limited, both in Lagos. In Kano, Mr. GT and Mr. IA, both providers of solar panels, inverters and generating set.

SOURCE OF ENERGY AND ENERGY USAGE

i. Alternative Power types

What type of alternative power do you supply, and how does it run/operate?

Generating sets, solar panels for solar energy and inverters are the range of alternative energy sources sold by the off-grid energy providers in Lagos, Kano and Cross River. Those who provide solar panels for solar energy mentioned that the sun was generally the source of solar energy and that solar panels are installed to absorb solar energy, the providers in Lagos state mentioned that the photophobic panels are used in absorbing the rays of the sun which is then used in charging batteries for producing electricity. Also inverters were mentioned as using both Ac and DC, including inverters that are charged from solar energy as well as the national electricity grid.

> "Inverter works good (well) when you use it with batteries, and you put the inverter on the zinc and you enjoy yourself"
>
> - Mr. GT, off-grid energy provider, Kano state

Who are your current customers?

Generally most of the off-grid providers have their customers as the general public, those in Cross River mentioned that they have customers ranging from government facilities to households, pharmacy shops and small business. The off-grid providers in Lagos mentioned that their customers cut across barbing saloons, phone chargers and individuals.

Who are your target customers? Do you target traders and trading locations?

For the off-grid energy providers anybody who needs electricity is a target customer but the energy providers in Cross River hinted at wanting to sell the solar panels more except that it is quite expensive for the traders. Providers in Lagos targets the middle class individuals while those in Kano look forward to selling their products to other states e.g. Jigawa state.

ii. Challenges

Are there challenges in reaching your target markets?

The energy providers in Cross River reported that they face some challenges which are centered on the cost of installation of solar panels which in their opinion was on the long run better than other alternative sources of energy, but the cost may be too expensive for some to afford. Another challenge they identified was lack of awareness of solar energy. Likewise in Lagos state the providers complained about the fact that when they factor in the costs used in procuring these energy infrastructures to determine the price it tends to scare aware customers. However in Kano state they did not have any challenges as their customers buy the products steadily due to the instability of electricity in the state.

> *"We have challenges because the amount, we buy our products is quite expensive, by the time we look at shipment, cost and everything. It is quite high for our end user that is the major challenge we have right now"*
>
> - Mr. F.A, Business development manager, Energy & Tech Limited

iii. Trading locations; alternative power supplied

In which markets in this state do you provide electricity?

Generally, the alternative energy providers do not currently have a specific market that they render their services to in terms of sale, installation and servicing of solar panels or inverters, although individuals do patronize them for some products, especially inverters.

Are trading locations in this state generally connected to the national electricity (PHCN)? Roughly what proportions of trading locations are connected to the national electricity?

Most trading locations in Cross River state are not connected to national electricity (On-grid). However in Lagos many of the trading locations are connected to the national electricity (on-grid). Likewise in Kano the traders are connected to the main grid electricity but they are beginning to rely on inverters because of the irregularity of the main grid electricity while some trading locations have been off from the main grid since 2010 and now rely strictly on generating sets.

"Yes, they are connected to PHCN, but now they want to start with using inverters... since people have come to know of inverters, they have started to use the inverter"
- Mr. GT, off-grid energy provider, Kano

Do trading locations connected to the national electricity use alternative sources of power in this state or do they rely solely on PHCN? Please explain.

According to Off-Grid energy providers; all the trading locations (markets) sampled in this study use alternative sources of power, especially the power generating set, though some use inverters. The trading locations connected to the national electricity also use alternative power source, they do not rely solely on PHCN. One key reason for this is the lack of regular power supply from the PHCN.

How much alternative power sources do you sell, cost on average? (Classify them by capacity e.g. 10KVA. 20KVA etc.)

In Cross River the 1.5KVA inverters cost N150, 000 – N200, 000; while In Lagos the 10KVA will cost N1, 500,000. The minimum solar panels are sold in Cross River for N60, 000, while in Lagos state the solar panels and charge controller will cost between N280, 000 and N300, 000. The solar inverters are sold for N120, 000 and the panels itself cost N40, 000.

What capacity do your alternative power solutions provide? (e.g. 2KVA)

In Cross River the inverters sold range in capacity from 0.8KVA – 100KVA. In Lagos state the inverters range from 2KVA to as much as 1000KVA, the 2KVA inverters will power about 4 fans, 8 bulbs, a television set and a small freezer. In Kano the inverters sold can power an air conditioner and other appliances.

What type of appliances can be used with your alternative power solutions? AC or DC? What can be powered with the various power solutions you provide?

The inverters would power DC appliances and the solar will power AC appliances. Some of the devices include light bulbs, fans, computers, fridges, air conditioners etc. One of the energy providers responded that these alternative energy devices sources can power any appliance as long as it within its capacity of the alternative energy device.

iv. Laws controlling alternative power supply

Are there government regulation or laws that control the type or source of power to be used in markets and what are these laws?

There are no government regulations or laws that control the source of power to be used in markets in Cross River and Kano state. However these laws exist in Lagos to control the power and how to use it. One of the energy providers in Lagos mentioned there was the likelihood of a government law that restricts using the main grid electricity for commercial use.

When inquired if these laws limit the availability and use of alternative power in the markets, one of the independent energy providers (who deal in solar energy and inverters) in Lagos claimed the law limits the production of off-grid power for commercial purpose. It should be noted that the member of the regulatory board interviewed in Lagos also confirmed the existence of a law which is

primarily concerned about noise pollution, carbon emission pollution, as well as short and long term deployment of renewable energy. However, detailed information on this law or the source was not provided.

To curtail the effect of the law, he advocated for an increase in the number of dealers for alternative energy. He said, *"When people start off grid alternative power as business, it will limit government power. It will put pressure on government to do something about off grid alternative power."*

Are there government regulatory registration fees and dues/payments that are expected to be paid by energy providers before they can operate in markets? What/how much are they?

Only one of the respondents confirmed there are government regulatory registration fees and dues, though he could not state a particular figure. The providers from Calabar and Kano do not think such exist; the other energy provider from Lagos was indecisive.

What are your plans for market expansion in the nearest future?

Generally, the energy providers want to expand their business by identifying the issues that restrict individuals and companies from using alternative sources of energy and try to work around them in order to make the products easily accessible to all and any who would like to purchase it.

Summarily, the plans for market expansion in the nearest future is to look out for the major problems affecting people for not using alternative power and also seek funds/loan from banks in order to expand business.

Energy Expenditure

Payment options

How is payment made for the alternative power products you sell? Upfront/ Backend /instalmentally?

Generally the customers of the off-grid energy providers make their payments full at the point of purchase and on cases where it was not paid in full, it was usually 70% payment up front and the balance after installation of device infrastructures. However in Kano, a few customers pay installmentally but very rarely is this allowed and this is largely dependent on the customer.

Roughly how much is needed to use (maintenance and fuel costs) alternative power monthly?

Approximately about N5000- N 30,000 is used to maintain generating sets monthly depending on the type of generators and level of use. However maintenance cost for the solar infrastructures is minimal because it makes use of renewable energy, and does not require monthly maintenance cost perhaps yearly or even every two years.

What is the payment method available to your customers? Cash/POS/Bank payment /Transfer?

In Cross River, most payments are made in cash, bank payments and POS, while payments in Lagos follow the routine of cash payments for purchase of smaller products.

In terms of payment method traders prefer when paying for power solutions, most customers either prefer bank payments or cash, while the high earned individuals have preference for mobile application (mobile money), though this information was not disaggregated for formal and informal customers (traders).

What challenges do you face with the various payment option listed

Some of the challenges identified by the off-grid energy providers in the course of payment include delays in getting bank confirmation alerts for payment and the failure in technology of the POS device. While the off-grid provider has encountered challenges in defaulting customers who refused to pay at the stipulated time he has not had any major challenges during payment.

Is there an option for customers to make installment payments for alternative power solutions? Please explain

Generally, there are options for customers to make installment payments for alternative power solution**s**. However, these options are rarely adopted, partly because of the lack of trust in customer to keep to the terms of agreement. The off-grid provider in Lagos mentioned he has a business plan of partnering with banks to act as third party to pay on behalf of the customer, who then pays installmentally to the banks, obviously based on certain conditions.

Sales and Income

Monthly Income

How much income does the business bring? Say monthly.

Most of the off-grid energy providers were not able to specify exactly how much income they make due to the irregularity of sales. In Lagos however an estimated income of N300, 000 – N400, 000 to N7, 000, 000 – N8, 000,000 was made monthly depending on the customers that come.

Do you have other businesses that you do besides being an energy provider? What business is this?

None of the off-grid energy providers in Cross River state do any other business apart from providing alternative source of energy. In Lagos and Kano state, some of the energy providers engaged in other business like installation of electrical appliances and electrical consultation.

Do you actively try to go out and get more customers? If yes, how?

Generally, the off-grid energy provider in Cross River, Lagos and Kano state try to reach out to customers via communication marketing, and passing out fliers at organized gathering, as well as on the job marketing.

Access to credit and mobile money services

How will you describe your current level of access to mobile money services, & loan facility to aid your business?

Though the off-grid energy providers are aware of mobile money services, they consider it not readily accessible and they would prefer to use POS or other forms of transactions apart from Mobile money services. Except for one provider from Lagos, others do not make use of any loan facilities because it is not readily accessible and very discouraging. The specific responses are detailed in table 5.

Table 5. Access to credit and use of mobile service among the Off-Grid energy providers interviewed in this study

Location	How will you describe your current level of access to mobile money services;	How will you describe your current level of access to loan facility to aid your business?
Calabar	Not really accessible A lot of people use their phones to make payment	Don't use it
Lagos	It is good apart from using ATM, it is safe.	It is very poor because loan is not accessible in this country and very discouraging
	No not yet.	I would not be able to disclose that here.
Kano	I don't know of the mobile money, but I'm hearing about it, I heard my friends talking about it.	No, I am doing it with my personal money. I don't want any bank problem

Challenges: political, economical, social, Legal, Environmental, and Technological

Do you face any economic and Political challenges in doing business in this state? What challenges?

The Off-grid providers in Lagos (inverter and solar providers) mentioned that they have economic challenges such as lack of financial aids from external source such as the banks, and as a result either plough back profit or rely on financial assistance from family and friends to finance their businesses. The providers in Cross River and Kano claimed they do not have any economic challenges. Generally, there has not been any political challenge.

Do you face any social challenges, such as the social norms, in doing business in this state?

The Off-grid providers in Lagos mentioned that they encounter social challenges such as deficiency in communication when trying to communicate with unlearned individuals and those who cannot relate with technical terms. Also, they are faced with environmental challenges such as climatic conditions which affect their sales as on normal or sunny days they have more customer than on cloudy or rainy days.

C. ENERGY PROVIDERS: ON-GRID

Generally, the officials of the Power Holding Company of Nigeria (PHCN) in Lagos, Cross River and Kano state were very informative concerning the present capacity of power the state was providing and how much power was necessary to meet the demands of the state as well as the capacity of power needed to run the state at optimum level. Added to this was information on how many household were being supplied within the states and the challenges in meeting up with the power demands, restrictions/conditions on the use of electricity in trading locations, plans for improvement in power supply and their knowledge on the use of alternative sources of power.

The present capacity of power generated in Lagos state is about 1,000 - 12000 mw but the maximum capacity to operate at optimum is 2000mw while Kano generates roughly 200 mw to 600mw currently and will require 1200mw to run the state at optimum capacity, Cross River distributes 136KVA currently and steps it down to 33KVA for industries and 11KVA for households. Where Kano provides electricity to over a million households for approximately 7 hours daily, Cross River supplies electricity to more than 8,000 households, besides the numerous that are connected without due recognition or permission of the national body. Lagos supplies electricity to well over a million households.

There are plans in Lagos state to improve on the stability of electricity transmitted to the state as well as creating awareness on power usage, officials in Cross River seem to think that if there was absolute privatization of the national electricity grid it would make for healthy competition which would yield better services while Kano is looking at the introduction of alternate sources of power like wind engines and solar power. All the states mentioned the use of generators and solar power and Lagos went on to mention the use of inverters by all classes of individuals and companies.

SOURCE OF ENERGY AND ENERGY USAGE (On-Grid Energy Provider)

Existing Energy Capacity

What capacity of power is available in this state (---MW)

"From transmission, we have 132KVA. That is what is being fed into Calabar. For distribution, we have it stepped down to 33KVA and 11KVA feeder for home and industrial use. This goes to transformers and sub-stations. Sub-stations are transformers. Injection sub-stations boost the power to have 100% efficiency"- Mr. I.B. maintenance department, Calabar

Approximated Available power capacity (in Megawatts -MW) and required capacity in the study locations

State	Available capacity	Required capacity to meet the needs of this state	Required capacity to operate at optimal capacity
Lagos	1,000-1,200MW	2,000 MW	2,000MW
Kano	600MW	1,200MW	1,200MW

What capacity is required to meet the needs of this state?

Generally Kano, though an independent state caters for the electricity needs for two other states viz; Katsina and some regions of Jigawa states. As a result, the energy capacity requirements from the national electricity distribution for the Kano zone is equivalent to that required by the three states, which is between 600MW to 1,200 MW. Lagos on the other hand being densely populated and in need of high energy demand, may not be able to accurately ascertain the capacity of power required to meet the ever increasing human, infrastructural and industrial demands, though a projected 2,000MW is usually the expected requirement.

What is required to operate at optimal capacity?

The Kano national electricity station will require 1,200MW of electricity to supply the state for it to operate at optimal capacity. Lagos state will require 2,000MW to operate at optimal capacity. *"At optimal capacity, it is (Lagos) required to operate at about 2,000 MW."*

Cross River can operate at optimum capacity with what they currently have going for them which is 132 KVA. However due to the lack of adequate amount of sub-stations in the state to overcome the problem of phase 'imbalancing' (over-loading) the state will operate below its capacity as there are leakages of power (due to low number of sub-stations), causing resistance which also causes low voltage and low voltage uses more current.

With the current capacity, how many hours a day; days a week; and to roughly how many households do you supply power?

In Cross River state, over and above 8000 households are 'legally' (recognized and connected by the power holding company) connected to the main electricity grid of the state not counting those households that are 'illegally connected to the grid.

According to the respondents from the PHCN Ikeja, Mr. T.D., several millions of households and thousands of companies and trading locations are being supplied with electricity for between 15 – 20 hours a day. Over a million households in Kano is supplied with electricity for an average of 5-7 hours daily.

Overall, a notable challenge in meeting the power need of your customers is that the demand for power supersedes the supply. There are too many households, but less available power.

Challenges facing power

Are there challenges in meeting with the power need of your customers? If yes, what are these challenges?

Evidence from the information gathered during the interviews suggested that one of the major challenges faced by the national electricity generation company is the high number of untrained and low-skilled technicians/electricians who provide low quality work services such as the installation and repair services. These group of people are not formal employees of the power company, but are patronized by members of the communities; the lack of expertise of these individuals also contribute to existing technical issues.

For example in Cross River state, these untrained individuals connects more than the required number of households to the substations (transformers) which results in the phase imbalance that has led to the incessant interruption of power. The PHCN officials also complained that on many occasions customers do not inform them of power connection problems. 'Another challenge is the outdated and faulty equipments as well as inadequate national supply to the Kano zonal office, said Mr. M.S, Kano PHCN. In Lagos where electricity is being distributed uniformly among households and industries the challenges observed was similar to that of Cross River with regards to the lack of adequate transformers to handle the number of households and industries that make demands on electricity In the state. Overall, a notable challenge in meeting the power need of your customers is that the demand for power supersedes the supply. There are too many households, but less available power.

Are there areas in this state that do not have electricity from the National source? Please explain.

In Kano about 40% of the households are yet to have electricity from the National electricity grid as stated by the head technician of Kano Electricity Distribution Company (KEDCO). It was also reported that in Kano, though efforts have been made to connect these distant areas to the main electricity grid by erecting electricity poles, the indigenes of the towns have refused, sometimes due to lack of financial capacity to purchase the necessary materials such as electric wires, to connect to the poles. Likewise in Lagos and Cross River state, there are areas that are not connected to the national electricity grid although these areas are a lot less in Lagos than in Cross River, an example of such an area in Lagos includes Ayobo Aiyetoro.

Existing restrictions/regulatory laws controlling power usage in markets

Do you provide electricity to trading locations? Are there restrictions with the amount of power which can be available in locations?

Power is provided to trading locations in each of the three states with no restrictions in Lagos or Kano state. However in Cross River State there is a restriction on the amount of power given to the trading locations because it is dangerous to feed high amounts of energy into the trading locations for safety reasons and as such 11KVA is the standard amount transmitted to trading locations.

"Yes we provide electricity for markets, it is dangerous to feed 33KVA to the market, so what they have is 11KVA because of the large crowd always around in the market"

- Staff with the maintenance department, Cross River state.

Are there government regulatory laws that control the source of power to be used in markets? What are these laws?

There are no government regulatory laws that control the source of power to be used in the markets in all of the three states and as such all traders are permitted to use whatever source of power/electricity he/she prefers.

Plan for the future

What is the plan for power supply in the nearest future?

Following some hints on governmental initiatives about the complete privatization of the power sector, officials in Cross River feel that this initiative would lay more ground for improvement in the sector because of the influx of other players and thus healthy competition among energy providers which would yield in better service. The main objectives of the Ikeja Electricity Distribution Commission (IKEDC) as stated by one of the officials is to maintain distribution network and marketing activities and to create awareness regarding energy usage and consumption within the state. Officials of the Kano distribution commissions stated that future plans are being set up to provide electricity to far and rural areas coupled with constant supply of electricity to present customers. Though the head of technical department of KEDCO felt that the NERC would be in the best position to respond to this question, he did mention plans for the usage of solar energy and wind sources.

"The main objective of Ikeja electricity distribution company (IKEDC) is to maintain distribution network and marketing activities and to create awareness regarding energy usage and consumption in the state in the nearest future" – Staff of PHCN Ikeja.

Alternative source

Do people in this State use alternative sources of power? How common is the use of alternative power sources in this state?

The use of generators is very common in Cross River state but less regular in the use of solar energy due to the fact that the infrastructures of the use of solar energy are quite expensive to procure. However in Lagos, the use of generating sets, solar energy and inverters are very common in the state even among both small and large scale industries, in fact an official at PHCN Ikeja feels that the use of these alternative sources is higher compared to the use or reliance on the national electricity supply, likewise in Kano state where the use of generating sets and solar panels are in use.

D. REGULATORY BODIES (MINISTRY OF ENVIRONMENT)

Officials of the ministry of environment were interviewed to obtain information and opinion on the power and energy needs of the retail sector. These officials reported that most traders used both electricity from the national grid as well as alternative sources of power and they (traders) having to use alternative sources of power most often due to the irregularities of power from the national electricity grid.

The alternative sources of energy used by traders include generating sets and solar panels though they use more of generating sets because they are cheaper to purchase and to run compared to solar energy infrastructures. There are no market nor governmental regulatory laws that control the source of the power to be used in markets but the ministry of environment prefers the use of solar energy because it is renewable energy and causes no form of environmental pollution but so far there has be no enforcement of the use of any particular alternative energy source within the markets.

There are no government regulatory registration fees being paid by energy providers. However in Cross River there was to be introduced a charge on energy providers who provide generating sets and the charge will vary with respect to the capacity of the generators being provided, but this directive is yet to be enforced.

In this section, we discuss the observations from the interviews with the ministries of environment (MoE). The responses from these government personnel also corroborate the observations made by the market authorities/association members, especially on questions such as traders use national electricity power source (PHCN) and/or alternative power in different markets, which do they use more and why, the types of alternative power sources available and the one they use more, the availability of the preferred power and why, as well as if there government regulatory laws that control the source of power to be used in markets and what these laws are.

> "They use the alternative power source, because the national power (PHCN) is not constant. Generating sets and solar energy, the generating sets are more in use, because they are more affordable than the solar"
>
> Mr. M.S., Senior Environment Officer, MoE, Kano State

According to them, most traders generally use both the national grid electricity and alternative power. Traders and individuals use more of alternative sources of power than they would use national electricity because of its inconsistency. Again, the traders use mainly generating sets and solar panels though they use generating sets because it is more affordable for them than the solar panels. Generating sets are always more available because they are easy to use and are more affordable when compared to solar panels, which are known to be more expensive.

Government regulatory laws/bodies; factors for alternative power demand and use

When asked if there are government regulatory laws that control the source of power to be used as well as the operation of alternative power in markets, the MoE respondents confirmed that there are no specific laws that control the operation of alternative power in markets however the ministry of environment in Cross River state prefers the use of solar energy because it does not produce any form of pollution.

In Cross River state, the National Environmental Standards and Regulations Enforcement Agency (NESREA) made plans to bring in equipment to test the pollution level of generating sets used in the markets but as at the moment this is yet to be effected. However there are no government regulatory bodies that control the operation of alternative power in markets.

"There was a time NESREA came up with the news that they are bringing in Equipments that will test the pollution level of some generators but for now nothing"

- Mr. A.K, MoE, Cross River

Government regulatory registration fees and dues/payments

Are there government regulatory registration fees and dues/payments that are expected to be paid by energy providers before they can operate in markets? Describe in details.

In Kano state the only charges expected to be paid are market revenues while in Cross River state there are fees to be paid with respect to those who provide generators and these fees are based on the size of the generators but for those who provide solar energy no charges will be demanded because they make use of renewable energy and as such no pollution but these fees are yet to be levied on the energy providers in the markets.

"Yes there are supposed to be fees because there was a time this department was trying to do an assessment of generators. For example, if you are using a 5KVA generator, there is an amount you pay to the government, but it has not been implemented. But for solar energy, we didn't take them to consideration because they do not pollute the air, they are renewable energy"- Mr. A.K., MoE, Cross River Ministry of Environment

E. REGULATORY BODIES (ENERGY BOARD)

Officials at the state energy board in Cross River, Lagos and Kano state were interviewed and they had much to say on power and electricity needs of the retail sector in these states. They reported that traders in the state used both the national electricity grid and alternative sources of energy and that they generally used alternative sources of energy more. However this usage was highly dependent of the availability of national electricity as can be seen among traders in Lagos who would readily use the national electricity source because it is cheaper than alternative sources of energy.

The alternative sources of energy available to traders include generating sets, solar panels and inverters. However, most traders prefer to use generating sets because it is readily available, cheaper to acquire and use as compared to solar panels which are quite expensive.

There are no market laws that control the type of energy source to be used in the markets in Cross River and Kano state but Lagos has policies on noise pollution and carbon emission pollution. In Cross River the national power authority and the state electrification board controls alternative power in the markets, while the Department of renewable energy from energy commission of Nigeria Council for renewable energy and National Electrical Regulatory Commission controls the operation of alternative power in Lagos state. In Cross River, energy providers must pay license fees to operate in markets while Kano imposes no registration fees on its energy providers within the market.

SOURCE OF ENERGY AND ENERGY USAGE

Three members of the energy board in each state, Kano, Lagos and Cross River were assessed during the In-depth Interviews. They are Mr. O.E of the State Electrification Board, Calabar; Chief (Mrs.) A.N of the Council for the Renewable energy of Nigeria, Lagos and Mr. M.A from the Kano State Rural Electricity Board was interviewed.

Use of national power (On-Grid) and alternative power (off-grid)

In this section, we discuss the observations from the interviews with the state energy board. The responses from these government personnel also corroborate the observations made by the market authorities/association members and MoE, especially on questions such as traders use national electricity power source (PHCN) and/or alternative power in different markets, which do they use more and why, the types of alternative power sources available and the one they use more, the availability of the preferred power and why, as well as if there are government regulatory laws that control the source of power to be used in markets and what these laws are.

Generally most traders use both the national grid electricity and alternative power mostly generators as well as solar panels although few of the traders use solar energy in Cross Rivers state because it is expensive. However in Cross River state, those who are connected to the 33KVA live have constant electricity 24 hours a day because that line is supplied directly from Port-Harcourt. According to Mr. M.A, Kano state Rural Electricity Board, "The wholesale and retail markets uses both the national power (PHCN) and the alternative power sources, i.e. solar energy or the use of power generating set."

In Cross River they mostly use generating sets, while in Lagos they make use of the national electricity most often because it is cheaper to run except of course when there is absence of power then they resolve to alternative sources. In Kano, traders and individuals use more of alternative sources of power than they would use national electricity because of its inconsistency.

On the types of alternative power sources available and which are used more, generating sets are most common in all the states followed by inverters and then solar power. However in Kano they use more of generating sets for its affordability and ease in handling and solar power. Mr. O. of the State Electrification Board, attested to this accordingly. He commented "We have more people using generators and some inverter but very few people use solar energy. With a N300, 000 you can get solar energy at home"

Overall, generating sets are most common in all the states followed by inverters and then solar power

On the availability of the preferred power and why, generally most people make use of generators because it is most available and largely affordable as compared to any other source of power coupled with the fact that solar energy is quite expensive.

Presence and impact of Market laws on power usage

Are there market laws that control the source of power to be used in markets in this state?

There no market law controlling the markets in Cross River and Kano state due to the fact that electricity is essential to traders in meeting the demands of their customers and as such no restrictions have been made on this wise. However, In Lagos state there are laws controlling the source of power used in markets and these laws include the policies on noise pollution, carbon emission pollution, short and long term deployment of renewable energy.

"No, we don't have any laws that control the source of power to be used in the market since there is no constant supply of power and the marketers want to meet the demands of their customers. I think creating a law to control the source of power will not be a good idea"

-Mr. M.A, Rural Electricity Board, Kano

Government regulatory laws/bodies; factors for alternative power demand and use

On the question if there are government regulatory bodies that control the operation of alternative power in markets, the state electricity board members responded that, in Cross River the national power authority and the state electrification board controls alternative power in the markets, while the Department of renewable energy from energy commission of Nigeria Council for renewable energy and National Electrical Regulatory Commission controls the operation of alternative power in Lagos state. Kano has no government regulatory body controlling the operation of alternative power in markets.

There are no government regulatory laws that control the source of power to be used in markets. Also, there are no government regulatory laws that control the operation of alternative power to be used in markets.

Government regulatory registration fees and dues/payments

Are there government regulatory registration fees and dues/payments that are expected to be paid by energy providers before they can operate in markets? Describe in details.

In Cross River state, energy providers must consult the federal government (National Power Authority) to get their license and other certifications and then to the state level before they can come into the markets. However in Lagos state, there are fees but most people don't pay them; they pay value added tax (VAT). In Kano there are no government regulatory registrations fees for energy providers to operate in the markets but if any charges were to be demanded of them it will be made by the National Electricity Commission (NEC).

F. INDEPENDENT ENERGY PROVIDERS:

The independent energy providers refers to those individuals who have a daily business of providing alternative energy in the trading locations through generating sets, solar energy etc. Six independent energy providers were interviewed to obtain information on the energy needs of the traders in the market.

All of them provide alternative energy to traders via generating sets, some as small as 3KVA producing 3000 watts for about 20 – 30 shops, 8KVA producing 8000 watts for 40 shops and some as large as 100KVA producing 100,000 watts for large shopping complexes that have over 120 shops. These energy providers can power close to 50 bulbs, fans, sewing machines, soldering irons and some power refrigerators as well, though appliances such as water heater and electric pressing iron are not allowed to be used.

The independent providers collect their payments from their customers (traders) usually on daily basis after services have been rendered; only very few in Kano collect their payments weekly by sending out security men and workers around to collect. The energy provider in Cross-River State supplies energy for 11 hours daily for six days, while in Lagos the energy provider provides energy for 8 hours daily. In Kano State, one of the energy providers supplies electricity for 5 hours at night and 8 hours during the day, others supply for 5 – 6 hours daily.

All of the independent energy providers would like to try other alternative sources of energy such as solar energy because of its durability and its use of renewable energy, the energy provider in Cross-River state made mention of electrical generating sets that make use of batteries. In Kano and Lagos state the energy providers were very open to the use of solar energy and would be willing to try it if it were made available.

SOURCE OF ENERGY AND ENERGY USAGE

Type of alternative power provided

What type of alternative power /electricity do you provide? How does it run/operate?

All the independent energy providers interviewed in all three states referred to generating sets as the source of alternative energy they provide. The independent energy provider in Cross River state reported that he uses a generator that provides 3000 watt for his customers, while an independent energy provider in Lagos state uses a 100 KVA generator. In Kano state the independent energy provider uses a generator that produces 8000 watt of electricity for his customers.

Number of customers

How many traders, shops/outlets do you provide this service to?

In Cross River state and Kano state, the independent energy providers claimed that he provided electricity for 20 – 40 shops and one of the energy providers in Kano also added that he has the capacity to provide electricity for more shops whenever the demand increases. The Independent energy provider in Lagos reported that with his 100KVA generator he provides energy for a shopping complex which has about 120 shops and is still undergoing constructions to add up more shops for which he will also provide alternate energy via his generating set.

What amount of energy or how many appliances can the energy provided power?

In Cross River state, the energy provider reported that of the 20 shops he is able to supply alternative energy, all of them can use appliances such as television sets, a soldering iron and a big refrigerator if necessary, as his generating set has the capacity to generate 3000 watts of electricity. In Kano state, they reported that 20 fans, 50 bulbs, sewing machines and televisions could be used and for those energy providers whose generating sets had higher capacity, refrigerators could also be used. Nevertheless, things like pressing irons and heaters are not permitted because the generating sets cannot bear these appliances. However in Lagos the energy provider who uses a 100 KVA generating set reported that his generator can power 99% of electrical needs in the shopping complex.

> It can provide for many appliances that you can think of: Fans, fridge, television, sewing machines that uses electricity and all that.
>
> – Independent energy provider in Kano State

Cost of service provided

How much do you charge for this service? Are customers charged based on the number or size of appliances they have or is there a flat rate for everyone?

A flat charge of N100 per day for each shop regardless of the appliances used was demanded by the independent energy provider in Cross River state. In Kano state, most of the independent energy providers charge their customers based on the appliances used; those who use only bulbs and/or fans are charged N100, any other appliance used will attract an extra N100 per day or more, depending on the appliance(s). Some independent energy providers in Kano charge a fixed daily rate of N200 per shop.

Timing and duration of service provided

How many hours a day do you provide this service for? How many days a week?

In Cross River, independent providers supply energy for six days in a week, from 7am to 6pm daily. In in Kano state, only one of the independent energy providers interviewed claimed to provide energy for 8 hours during the day, while another provide energy for 5 hours at night and 8 hours during the day. Some others provide electricity for 6 – 7 hours a day for seven days. In Lagos, the independent energy provider provides electricity for 8 hours daily.

Customers preferred payment method

How do your customers pay for the service you provide? Is payment made up front or backend? Are installmental payment options allowed?

Most of the customers of the independent energy providers pay for the services daily and that after services have been rendered which is a common practice in Cross River and Lagos states. Likewise in Kano state, most of the energy providers collect their payments daily after the service has been rendered through servants that they send out to collect the money, although some of the independent energy providers in Kano collect their payments weekly from their customers.

Usage of other alternative energy sources

Would you consider providing electricity using other energy or power sources? What other power or energy sources would you consider using?

All the independent energy providers are open to the idea of other alternative sources of energy for power distribution. The energy provider in Cross River State made mention of the use of solar energy and electric generators and the willingness to use them should they be made available to him, because of the poor returns on using generating sets. Likewise in Lagos State the energy provider attested to the durability and ease of using solar energy for business. In Kano, the energy providers are aware of other alternative sources such as solar energy and they would like to use it because it is not hard to maintain and somewhat self-sustaining. Others will make use of other alternative sources of energy if it is cheaper to obtain and manage.

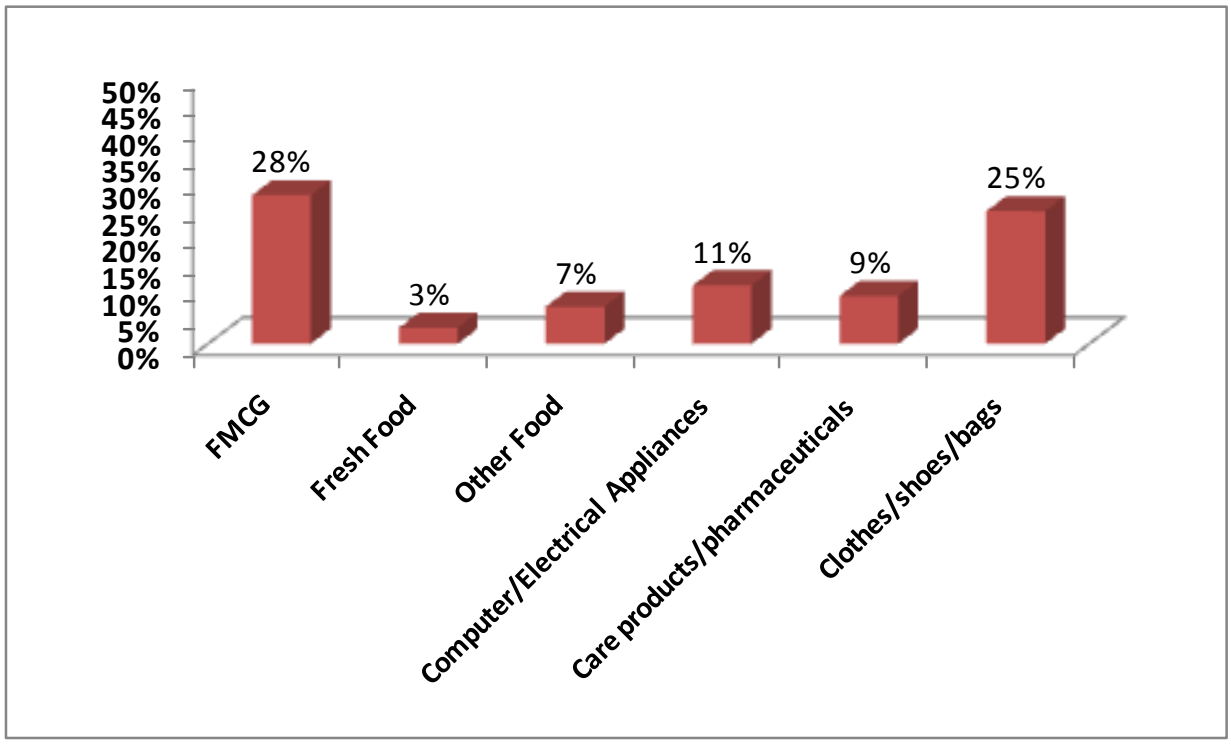
Yes, because every human being really wants ways that he can develop, like that of the Solar we can get it, because you don't have to bother about how to maintain it, it does not consume fuel, as it uses the sunlight to charge it, and i think that is the best. It does not require much space, what it really needs is the sunlight. With solar there is nothing like you being dirty, you can make use of any clothes to do your work of providing light to the people. Mr. Y.I, Independent Energy provider, Kano

Quantitative Survey among Traders

Traders' Profile and Demographics

- All the traders (702) interviewed were the owners or managers of their businesses.

Fig. R5: Products Traded



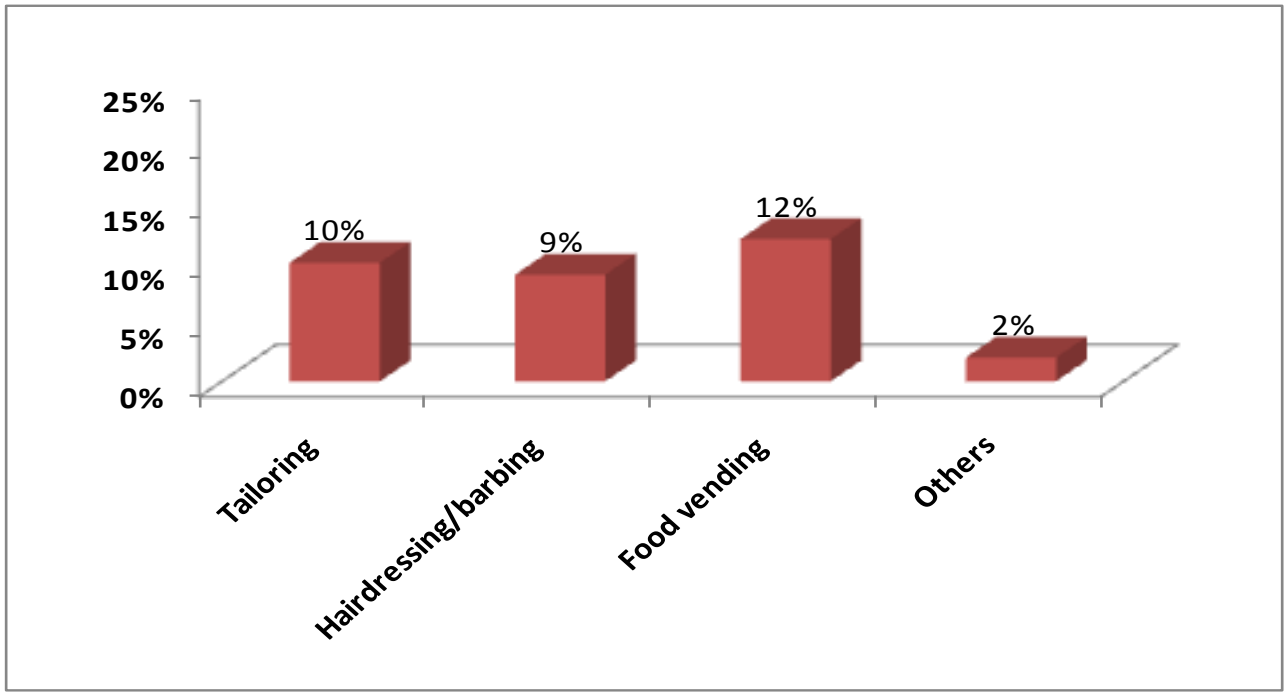
- Among the traders sampled across the 3 states, more than a quarter of them (28%) sell FMCGs, a quarter (25%) sells clothes/shoes/bags, 11%; computer/electrical appliances, 9%; care products/pharmaceuticals, 7%; other foods and 3% sell fresh foods.
- It is worth noting that these categories of goods sold are not mutually exclusive; some traders were found combining more than one category of products.
- Details of the categories of goods sold by the traders are presented in table R5.

Table R5: Products Traded

		N	FMCG	Fresh food	Other food	Electrical Appliances/ Electronics	Care products/ pharmaceuticals	Clothes/ shoes/ bags
Total		702	28%	3%	7%	11%	9%	25%
Outlet	**Formal**	351	27%	3%	5%	15%	9%	21%
	Informal	351	29%	3%	8%	8%	9%	28%
State	**Lagos**	234	22%	2%	8%	9%	12%	20%
	Cross River	234	33%	3%	9%	12%	10%	27%
	Kano	234	29%	4%	2%	13%	6%	26%
Gender	**Male**	469	28%	3%	2%	16%	10%	26%
	Female	233	29%	3%	15%	2%	7%	21%
Urbanisation	**Urban**	162	24%	2%	6%	9%	7%	38%
	Peri-urban	324	29%	3%	7%	14%	9%	20%
	Rural	216	31%	3%	6%	9%	11%	21%

- In Cross-River state, more of the traders sampled sell FMCG products, representing almost 1 in every 3 traders, as reflected in the population.
- Electrical appliances were sold more by formal outlets (15%), and were clearly sold more by men (16%) than women (2%).
- Almost 4 out of every 10 retailers in the urban region sell clothes/shoes/bags.

Fig. R6: Services Rendered



- Among the respondents sampled across the 3 states, 12% of them engage in food vending, 10% in tailoring and 9% in hair dressing/barbing.
- Details of the services among the different groups are presented in the table below:

Table R6: Services Rendered

		N	Tailoring	Hairdressing /barbing	Food vending	Others
Total		702	10%	9%	12%	2%
Outlet	**Formal**	351	12%	8%	11%	2%
	Informal	351	8%	10%	13%	3%
State	**Lagos**	234	13%	11%	12%	0%
	Cross River	234	10%	9%	15%	1%
	Kano	234	7%	7%	9%	6%
Gender	**Male**	469	8%	7%	7%	4%
	Female	233	14%	12%	21%	0%
Urbanisation	**Urban**	162	10%	6%	10%	1%
	Peri-urban	324	10%	9%	13%	2%
	Rural	216	10%	12%	12%	4%

- 2 out of every 10 female retailers trade as a food vendor while 1 out of every 10 retailers render services such as tailoring, hairdressing/barbing, food vending amongst others in all markets irrespective of the outlet, state, gender or urbanization.

Table R7: Gender Distribution of Traders

		N	Male	Female
Total		702	67%	33%
Outlet	**Formal**	351	69%	31%
	Informal	351	65%	35%
State	**Lagos**	234	46%	54%
	Cross River	234	59%	41%
	Kano	234	95%	5%
Urbanisation	**Urban**	162	63%	37%
	Peri-urban	324	68%	32%
	Rural	216	68%	32%

- Two-third of the traders are males and in Kano, 9 out of every 10 trader is a male.

Fig. 7: Gender Distribution among all Traders and in Kano state

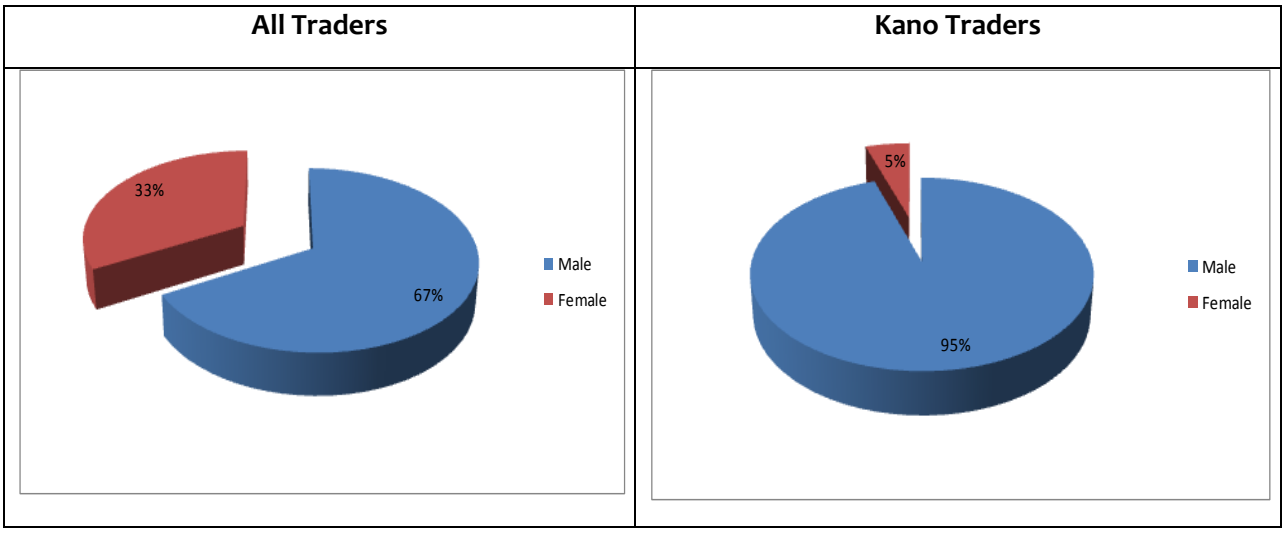


Table R8: Number of Staff

			Number of Staff			
		N	Mean	S.D	Minimum	Maximum
Total		702	2	1.08	1	8
Outlet	**Formal**	351	2	1.22	1	8
	Informal	351	1	0.86	1	7
State	**Lagos**	234	2	1.02	1	8
	Cross River	234	2	1.19	1	8
	Kano	234	2	1.03	1	8
Gender	**Male**	469	2	1.10	1	8
	Female	233	2	1.06	1	8
Urbanisation	**Urbanisation**	162	2	0.96	1	5
	Peri-urban	324	2	1.12	1	8
	Rural	216	2	1.12	1	8

- Irrespective of the states, gender or urbanization, traders generally have an average of 2 staff. The informal outlets reported an average of only 1 staff.

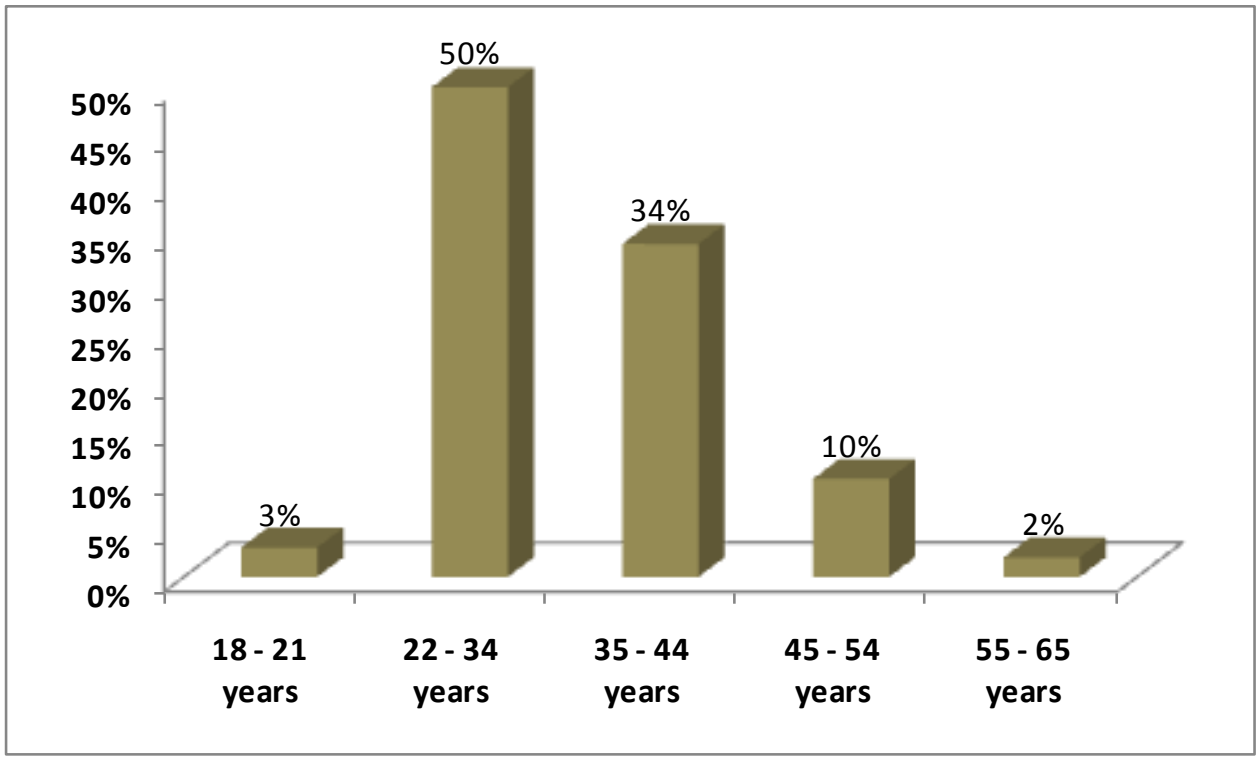
Table J1: Mean Age of Traders

			Mean Age of Traders			
		N	Mean	S.D	Minimum	Maximum
Total		668	34	7.97	18	65
Outlet	**Formal**	335	34	7.76	19	62
	Informal	333	34	8.18	18	65
State	**Lagos**	234	35	7.13	19	57
	Cross River	202	33	8.01	18	57
	Kano	232	33	8.57	18	65
Gender	**Male**	450	34	7.95	18	65
	Female	218	35	8.00	20	57
Urbanisation	**Urbanisation**	152	33	6.64	20	62
	Peri-urban	310	34	8.58	18	58
	Rural	206	34	7.90	18	65

- The average age of traders was observed to be 34 years among all traders, same was reported for the different outlets. The Lagos traders (35 years) were observed to be older

than the traders in Cross River (33 years) and Kano state (33 years). Older traders (35 years) were recorded more among the males than the females (34 years), while the traders in the urban markets, traders (33 years) were slightly younger than the peri-urban (34 years) and rural (34 years).

Fig. J1: Age Distribution of Traders



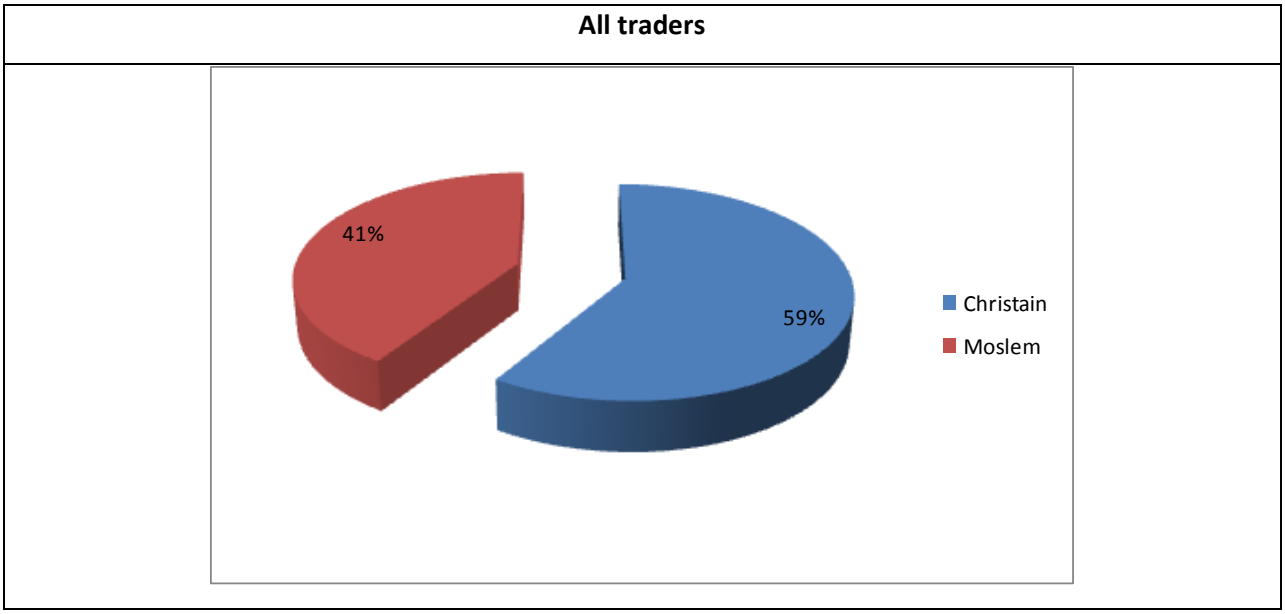
- Half of the traders are age group 22 – 34 years while about one-third are age group 35 – 34 years.

Table J1.2: Traders'Age

		N	18 - 21 years	22 - 34 years	35 - 44 years	45 - 54 years	55 - 65 years	Refused
Total		702	3%	50%	34%	10%	2%	0%
Outlet	**Formal**	351	3%	51%	34%	11%	2%	0%
	Informal	351	4%	50%	34%	10%	3%	0%
State	**Lagos**	234	1%	47%	41%	10%	2%	0%
	Cross River	234	4%	52%	30%	12%	2%	0%
	Kano	234	6%	52%	29%	9%	4%	1%
Gender	**Male**	469	4%	52%	31%	10%	3%	0%
	Female	233	2%	47%	38%	11%	2%	0%
Urbanisation	**Urban**	162	4%	55%	34%	6%	1%	1%
	Peri-urban	324	4%	48%	32%	13%	3%	0%
	Rural	216	2%	49%	36%	9%	3%	0%

- Similar trends of age distribution was observed irrespective of the outlet and urbanization. However, Lagos traders have the highest proportion of 35 – 44 year old traders (41%), while female traders in the age group of 35 – 44 years were also notably high (38%).

Fig. J2: Traders' Religion



Religion of Traders in Cross River and Kano state.

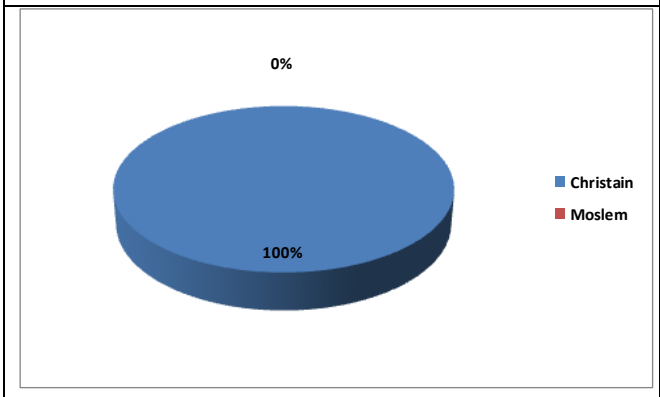
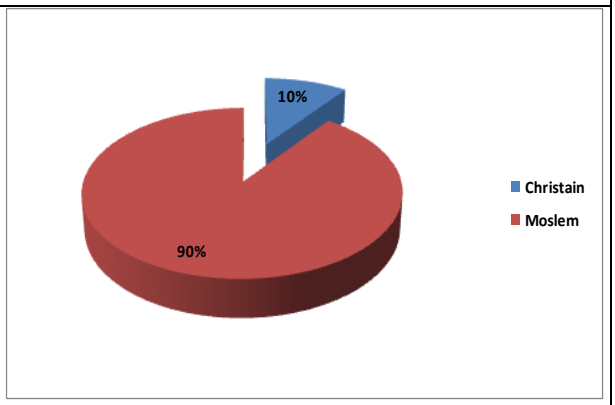
Cross River Traders	Kano Traders
	

Table J2: Traders' Religion

		N	Christian	Moslem
Total		702	59%	41%
Outlet	**Formal**	351	62%	38%
	Informal	351	55%	45%
State	**Lagos**	234	66%	34%
	Cross River	234	100%	0%
	Kano	234	10%	90%
Gender	**Male**	469	49%	51%
	Female	233	77%	23%
Urbanisation	**Urban**	162	59%	41%
	Peri-urban	324	60%	40%
	Rural	216	57%	43%

- All the traders sampled in Cross River are Christians, whereas 9 in 10 traders sampled in Kano are Moslems. This reflects the actual distribution in the state population.
- Generally, 6 out of every 10 traders sampled is a Christian and 4 out of 10; a moslem.

Table J3: Average Household Size

			Household Size			
		N	Mean	S.D	Minimum	Maximum
Total		702	4	2.54	1	20
Outlet	**Formal**	351	4	2.68	1	20
	Informal	351	4	2.39	1	15
State	**Lagos**	234	4	1.58	1	8
	Cross River	234	4	2.42	1	20
	Kano	234	5	3.19	1	18
Gender	**Male**	469	4	2.77	1	20
	Female	233	4	1.99	1	18
Urbanisation	**Urbanisation**	162	4	2.11	1	13
	Peri-urban	324	4	2.50	1	18
	Rural	216	4	2.87	1	20

- The average household size of the traders was found to be 4. This holds true for the different outlets, gender groups and urbanization setting. However, Kano recorded an average household size of 5.

Table J4: The Number of people that contribute to household income

			Number of People Contributing to Household Income			
		N	Mean	S.D	Minimum	Maximum
Total		702	2	0.85	1	6
Outlet	**Formal**	351	2	0.86	1	6
	Informal	351	2	0.84	1	6
State	**Lagos**	234	2	0.65	1	6
	Cross River	234	1	0.59	1	4
	Kano	234	2	1.18	1	6
Gender	**Male**	469	1	0.92	1	6
	Female	233	2	0.69	1	6
Urbanisation	**Urbanisation**	162	2	0.87	1	5
	Peri-urban	324	2	0.92	1	6
	Rural	216	1	0.71	1	6

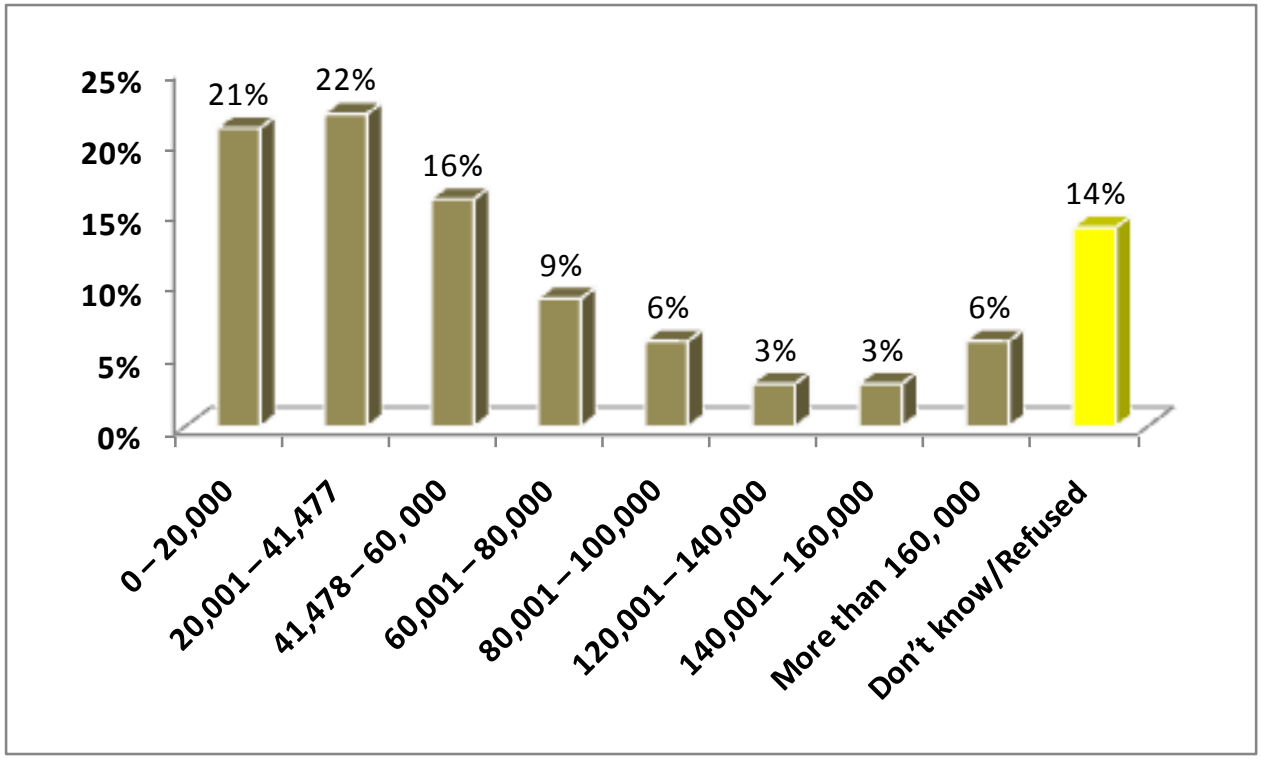
- The traders generally reported that 2 people contribute to their household income. The observation is slightly different for Cross River state and in the rural settings, where only 1 person contributes to household income.

Table J5: Total Monthly Household Income

			Total Household Income (Naira)			
		N	Mean	S.D	Minimum	Maximum
Total		412	71,633	94,410	10,000	800,000
Outlet	**Formal**	197	92,817	119,629	10,000	800,000
	Informal	215	52,223	56,740	10,000	450,000
State	**Lagos**	125	88,832	59,898	18,000	350,000
	Cross River	108	47,815	42,324	10,000	250,000
	Kano	179	73,994	128,245	10,000	800,000
Gender	**Male**	288	68,625	102,861	10,000	800,000
	Female	124	78,621	70,891	10,000	500,000
Urbanisation	**Urbanisation**	89	97,000	122,313	10,000	600,000
	Peri-urban	200	64,790	75,318	10,000	500,000
	Rural	123	64,407	96,871	10,000	800,000

- In general, the average monthly household income of traders was determined to be N 71,633. Traders with formal outlets have higher average monthly household income (N 92,817) than traders with informal outlets (N 52,223).
- Traders in Lagos have the highest monthly household income (N 88,832), followed by Kano (N 73,994) and the least is Cross River state (N 47,815).
- Generally, female traders reported a higher average household income (N 78,621) than the male traders (N 68,625).
- Household income was highest among the urban traders (N 97,000). The peri-urban traders reported an average of N 64,790, and the rural; N 64,407.

Fig. J5: Distribution of Total Household Income



- The modal class of income among the traders is N 20,001 – N41,447 (22%), closely followed by N 0 – N 20,000 (21%), and then N 41,478 – N 60,000 (16%).
- On the general, 59% of the traders earn N60,000 or below.
- Details of the total household income distribution within different groups are shown in table J5b.

Table J5b: Total traders' household income per month

		N	0 - 20,000	20,001 - 41,477	41,478 - 60,000	60,001 - 80,000	80,001 - 100,000	120,001 - 140,000	140,001 - 160,000	More than 160,000	DK/can't really say
Total		702	21%	22%	16%	9%	6%	3%	3%	6%	14%
Outlet	**Formal**	351	14%	21%	15%	12%	7%	5%	4%	8%	14%
	Informal	351	27%	24%	17%	7%	5%	2%	2%	5%	13%
State	**Lagos**	234	2%	8%	18%	20%	12%	7%	6%	9%	18%
	Cross River	234	26%	27%	18%	6%	6%	2%	2%	1%	12%
	Kano	234	34%	31%	11%	2%	1%	1%	1%	9%	10%
Gender	**Male**	469	25%	25%	14%	9%	4%	2%	2%	7%	13%
	Female	233	12%	16%	20%	10%	11%	6%	5%	6%	14%
Urbanisation	**Urban**	162	9%	25%	19%	7%	4%	4%	3%	11%	18%
	Peri-urban	324	20%	24%	15%	10%	8%	3%	3%	6%	12%
	Rural	216	30%	17%	15%	11%	5%	4%	3%	4%	12%

- Many (43%) of the traders earn a monthly total household income of N41,477 and below. 3 out of every 10 traders in Kano confirmed this.

Fig. J6: Feelings of Traders about Household Income

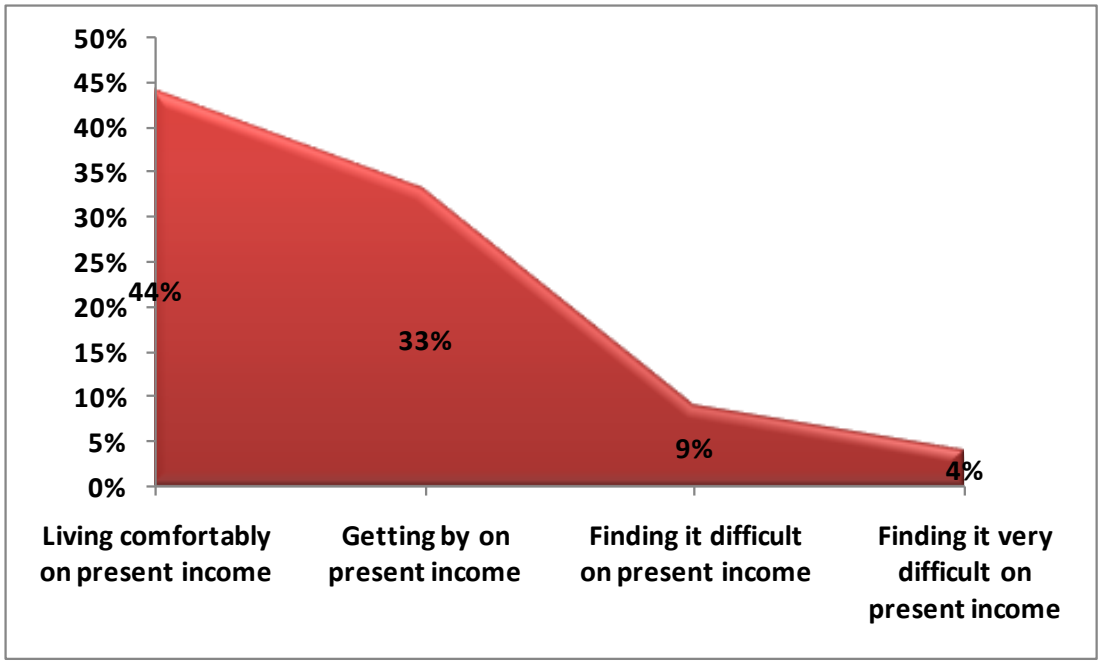


Table J6: Feelings of Traders about Household Income

		N	Living comfortably on present income	Getting by on present income	Finding it difficult on present income	Finding it very difficult on present income	Refused	DK/can't really say
Total		702	44%	33%	9%	4%	6%	5%
Outlet	**Formal**	351	48%	29%	11%	5%	4%	3%
	Informal	351	40%	36%	8%	2%	8%	6%
State	**Lagos**	234	41%	44%	4%	0%	10%	2%
	Cross River	234	24%	40%	12%	7%	6%	12%
	Kano	234	68%	15%	12%	5%	1%	0%
Gender	**Male**	469	48%	28%	10%	4%	5%	4%
	Female	233	35%	41%	8%	3%	9%	5%
Urbanisation	**Urban**	162	40%	37%	4%	4%	8%	6%
	Peri-urban	324	45%	31%	13%	4%	4%	3%
	Rural	216	45%	31%	7%	3%	7%	6%

- Many (44%) of the traders described their feelings about their household income as living comfortably on present income. 68% of the traders in Kano clearly reported this trend.
- 33% of the traders are getting by on the present income while 9% are finding it difficult on their present income.

Table J7: Saving Culture (from income)

		N	Save	Do not Save
Total		702	88%	12%
Outlet	**Formal**	351	91%	9%
	Informal	351	85%	15%
State	**Lagos**	234	96%	4%
	Cross River	234	79%	21%
	Kano	234	90%	10%
Gender	**Male**	469	89%	11%
	Female	233	88%	12%
Urbanisation	**Urban**	162	96%	4%
	Peri-urban	324	87%	13%
	Rural	216	85%	15%

- Most of the traders (88%) reported saving part of their income regularly.

Fig. J8: How traders finance themselves in times of emergency (e.g sudden illness or death)

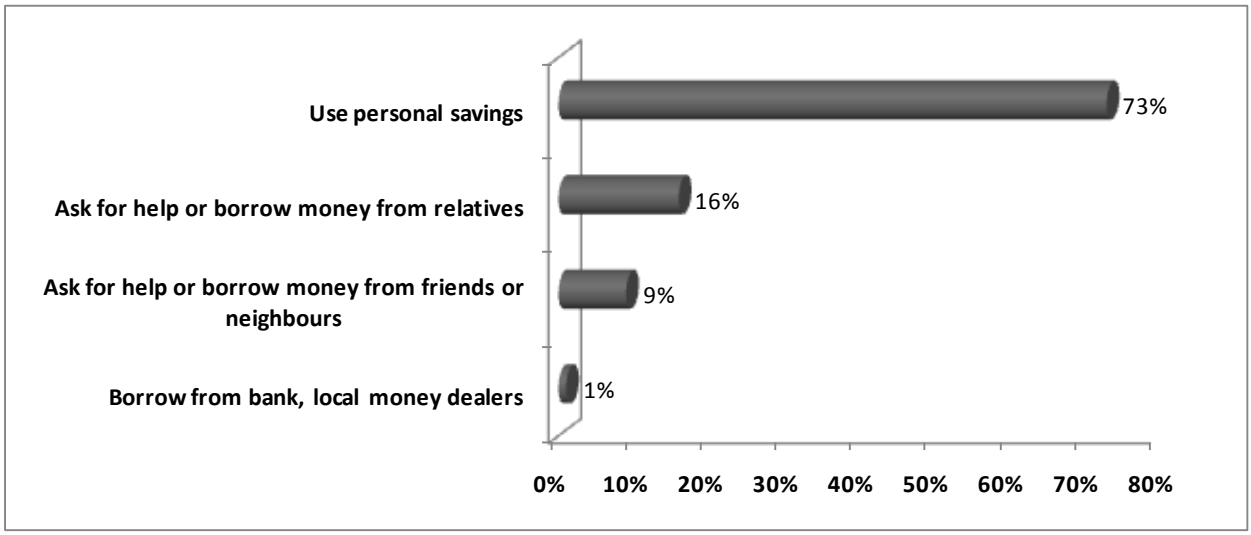


Table J8: How traders finance themselves in times of emergency (e.g sudden illness or death)

		N	Ask for help or borrow money from relatives	Ask for help or borrow money from friends or neighbours	Use personal savings	Borrow from bank, local money dealers	Others
Total		702	16%	9%	73%	1%	1%
Outlet	**Formal**	351	11%	11%	75%	2%	1%
	Informal	351	21%	6%	70%	1%	2%
State	**Lagos**	234	12%	9%	79%	1%	0%
	Cross River	234	9%	13%	72%	3%	3%
	Kano	234	26%	5%	68%	0%	1%
Gender	**Male**	469	19%	7%	71%	1%	1%
	Female	233	9%	12%	76%	2%	1%
Urbanisation	**Urban**	162	12%	4%	80%	1%	2%
	Peri-urban	324	14%	9%	74%	2%	1%
	Rural	216	21%	12%	65%	0%	2%

- When the traders were asked how they finance themselves in times of emergency (e.g sudden illness or death), 73% reported using their personal savings. The widely followed (16%) by 'ask for help or borrow money from relatives'.

- Traders in Kano are the fondest of asking for help or borrowing money from relatives (26%), while Calabar traders are least likely to ask for help or borrow money from relatives (9%).

- Traders in Cross River reported the highest practice of borrowing money from banks or local money lenders (3%). Traders in Kano and traders generally in the rural areas do not have any access to borrowing from banks or any local money lender.

- When the traders were asked how they finance themselves in times of emergency (e.g sudden illness or death), 73% reported using their personal savings. The widely followed (16%) by 'ask for help or borrow money from relatives'.

Table J9: Weekly expense on airtime for personal use

			Weekly expense on airtime for personal use			
		N	Mean	S.D	Minimum	Maximum
Total		683	1,157	1,424	100	20,000
Outlet	**Formal**	344	1,389	1,608	100	20,000
	Informal	339	922	1,166	100	18,000
State	**Lagos**	232	1,472	1,575	200	18,000
	Cross River	225	968	859	100	5,000
	Kano	226	1,023	1,647	100	20,000
Gender	**Male**	455	1,191	1,437	100	20,000
	Female	228	1,089	1,401	100	18,000
Urbanisation	**Urbanisation**	156	1,527	2,225	200	20,000
	Peri-urban	317	1,032	964	100	6,000
	Rural	210	1,073	1,186	100	10,000

- Traders reported a skewed maximum amount of N 20,000, as weekly expense on airtime for personal use. The minimum reported was N 100.
- The average weekly expense spent on airtime by the traders is N 1,157. Traders with formal outlets spend more on airtime (N 1,389) than traders with informal outlets (N 922).
- Lagos traders spend the most on airtime (N 1,472), compared with traders in other states, likewise, traders in urban settings spend the most on airtime compared with peri-urban and rural areas.

Section A: Business Premises Assessment

Table A1: Where the business is conducted

		N	Room in a building	Detached building	Stall	Kiosk
Total		702	41%	9%	23%	27%
Outlet	**Formal**	351	82%	18%	0%	0%
	Informal	351	0%	0%	46%	54%
State	**Lagos**	234	37%	13%	13%	37%
	Cross River	234	43%	7%	30%	20%
	Kano	234	44%	6%	25%	25%
Gender	**Male**	469	44%	7%	24%	24%
	Female	233	36%	12%	20%	33%
Urbanisation	**Urban**	162	46%	4%	35%	15%
	Peri-urban	324	42%	8%	18%	32%
	Rural	216	37%	13%	22%	28%

- Among the sampled outlets, 4 out of every 10 businesses were observed to be conducted in a room in a building, irrespective of the location. 1 out of 10; detached building (except in urban areas).
- 3 out of 5 informal outlets sampled were kiosks. However, this pattern varied greatly among the different groups.

Table A2: Ownership of the place where business is conduct

		N	Owned	Rented
Total		702	25%	75%
Outlet	**Formal**	351	13%	87%
	Informal	351	38%	62%
State	**Lagos**	234	17%	83%
	Cross River	234	15%	85%
	Kano	234	45%	55%
Gender	**Male**	469	30%	70%
	Female	233	16%	84%
Urbanisation	**Urban**	162	15%	85%
	Peri-urban	324	29%	71%
	Rural	216	27%	73%

- On the overall, ownership of the place where the businesses are conducted is only about 25%.
- Ownership of informal outlets (38%), is thrice as much as formal outlets (13%).
- Interestingly, ownership of business place is very high in Kano (45%), whereas it is as low as 17% in Lagos and just 15% in Cross River state.
- Ownership by male traders (30%) is twice as much as ownership by females (16%)
- Ownership in the urban areas (15%) appears more difficult to achieve than ownership in the peri-urban (29%) or rural areas (27%).

Fig. A2: Ownership of the place where business is conducted

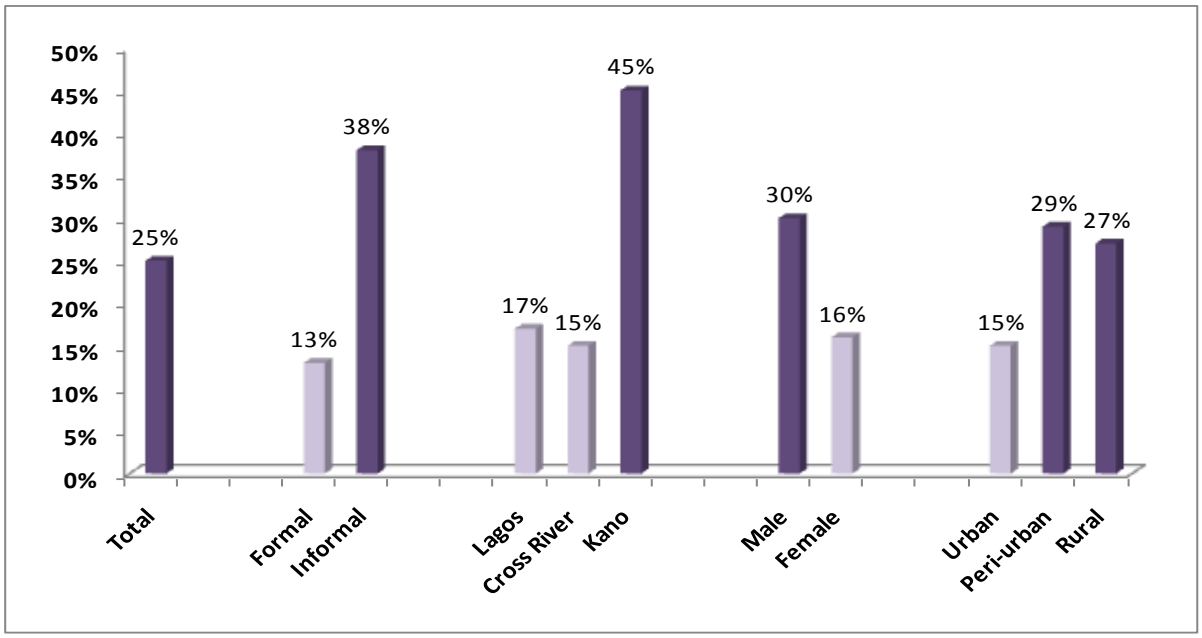


Table A3: Size of the Place where the business is conducted (M²)

			Area of the Place where the business is conducted (M²)			
		N	Mean	S.D	Minimum	Maximum
Total		702	8.50	7.18	1.49	83.54
Outlet	**Formal**	351	11.09	8.25	1.49	83.54
	Informal	351	5.91	4.67	1.49	26.77
State	**Lagos**	234	6.59	5.98	1.49	26.77
	Cross River	234	11.55	8.94	1.49	83.54
	Kano	234	7.36	5.02	1.49	23.81
Gender	**Male**	469	8.60	7.63	1.49	83.54
	Female	233	8.30	6.21	1.49	40.15
Urbanisation	**Urbanisation**	162	7.39	5.51	1.49	33.49
	Peri-urban	324	9.73	8.67	1.49	83.54
	Rural	216	7.50	5.34	1.49	26.79

- Traders generally use 8.50 m² area space for their business. Apparently, formal outlets have much larger area (11.09 m²) to do business than the informal outlets (5.91 m²).
- Ample space is not easy to come by in Lagos (6.59 m²) and Kano (7.36 m²) like it is in Cross River state (11.55 m²), likewise outlets in urban areas (7.39 m²), compared to the peri-urban (9.73 m²) and rural areas (7.50 m²) are smaller.

Table A4: Number of Rooms Used for the Business

			Number of Rooms Used for the Business			
		N	Mean	S.D	Minimum	Maximum
Total		702	1	0.64	1	10
Outlet	**Formal**	351	1	0.54	1	9
	Informal	351	1	0.72	1	10
State	**Lagos**	234	1	0.75	1	8
	Cross River	234	1	0.81	1	10
	Kano	234	1	0.13	1	2
Gender	**Male**	469	1	0.66	1	10
	Female	233	1	0.59	1	8
Urbanisation	**Urbanisation**	162	1	0.20	1	2
	Peri-urban	324	1	0.59	1	10
	Rural	216	1	0.88	1	9

- Generally, traders do business in only 1 room, irrespective of the type of outlet, state, gender or urbanization.

Table A5: Use of business premises

		N	Sales	Storage	Administration	Workshop	Others
Total		702	87%	17%	2%	16%	1%
Outlet	**Formal**	351	85%	15%	2%	18%	2%
	Informal	351	89%	19%	2%	14%	1%
State	**Lagos**	234	86%	12%	0%	16%	0%
	Cross River	234	91%	26%	3%	17%	1%
	Kano	234	84%	13%	2%	15%	3%
Gender	**Male**	469	88%	18%	3%	14%	2%
	Female	233	86%	15%	1%	20%	1%
Urbanisation	**Urban**	162	91%	19%	1%	10%	2%
	Peri-urban	324	86%	15%	2%	16%	1%
	Rural	216	85%	18%	3%	19%	2%

- The business premises of over 80% of the traders are used for sales irrespective of the outlet, state, gender or urbanization.

Section B: Nature and Volume of Trade

Table B1: Operational/Trading Hours per day

			Operational/Trading Hours per day			
		N	Mean	S.D	Minimum	Maximum
Total		702	11	2.22	4	15
Outlet	**Formal**	351	11	2.25	4	15
	Informal	351	10	2.17	4	15
State	**Lagos**	234	11	1.91	4	15
	Cross River	234	11	2.30	4	15
	Kano	234	10	2.17	4	15
Gender	**Male**	469	11	2.34	4	15
	Female	233	10	1.95	4	15
Urbanisation	**Urbanisation**	162	10	1.85	6	15
	Peri-urban	324	11	2.20	4	15
	Rural	216	11	2.43	4	15

- In assessing the number of hours traders operate, it was observed that traders generally trade for 11 hours daily, though with some slight differences among the groups:
- Formal; 11 hours and Informal; 10 hours.
- Lagos and Cross River; 11 hours while Kano; 10 hours.
- Male traders; 11 hours while female traders; 10 hours.
- Peri-urban and rural; 11 hours while urban businesses operate for an average of 10 hours.

Table B2: Reasons retailers trade/ render services for less than 8 hours

		N	Building is shared with others	Trading hours are restricted	Others
Total		50	2	8	40
Outlet	**Formal**	27	0	7	20
	Informal	23	2	1	20
State	**Lagos**	9	0	1	8
	Cross River	16	0	3	13
	Kano	25	2	4	19
Gender	**Male**	38	2	8	28
	Female	12	0	0	12
Urbanisation	**Urban**	13	0	4	9
	Peri-urban	17	0	2	15
	Rural	20	2	2	16

- 40 out of the 50 traders who trade for less than 8 hours had other reasons for doing so apart from 'building is shared with others' (2), and 'trading hours is restricted' (8). However, they could not ascribe it to any particular reason.

Table B3: Operational/Trading Days per Week

			Operational/Trading Days per Week			
		N	Mean	S.D	Minimum	Maximum
Total		702	6	1.64	1	7
Outlet	**Formal**	351	6	1.29	1	7
	Informal	351	6	1.89	1	7
State	**Lagos**	234	6	0.44	5	7
	Cross River	234	5	1.96	1	7
	Kano	234	6	1.76	1	7
Gender	**Male**	469	6	1.77	1	7
	Female	233	6	1.33	1	7
Urbanisation	**Urbanisation**	162	6	0.49	5	7
	Peri-urban	324	6	1.49	1	7
	Rural	216	5	2.18	1	7

- Traders generally operate their businesses for 6 days of the weeks. In Cross River, traders operate for 5 days of the week, likewise traders in the rural areas; 5 days.

Table B4: Does access to electricity/power affect activities and/or trading hours ?

		N	Yes	No
Total		702	60%	40%
Outlet	**Formal**	351	68%	32%
	Informal	351	53%	47%
State	**Lagos**	234	74%	26%
	Cross River	234	48%	52%
	Kano	234	59%	41%
Gender	**Male**	469	61%	39%
	Female	233	59%	41%
Urbanisation	**Urban**	162	60%	40%
	Peri-urban	324	65%	35%
	Rural	216	54%	46%

- 6 out of every 10 traders reported that access to electricity/power affect activities and/or trading hours. While this trend was generally similar, in Cross River only 5 out of 10 traders feel so. Same for informal outlets and outlets in the rural areas.

Fig. B4: Does access to electricity/power affect activities and/or trading hours ?

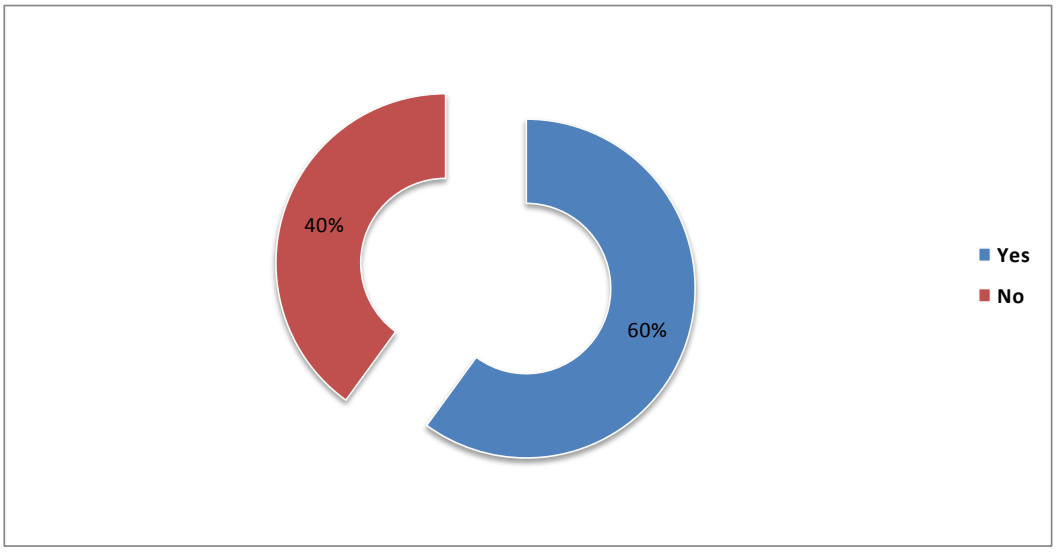


Table B6a: Was 'last trading day' a Week day or a Weekend ?

		N	Weekday	Weekend
Total		702	71%	29%
Outlet	**Formal**	351	68%	32%
	Informal	351	74%	26%
State	**Lagos**	234	82%	18%
	Cross River	234	45%	55%
	Kano	234	87%	13%
Gender	**Male**	469	73%	27%
	Female	233	68%	32%
Urbanisation	**Urban**	162	79%	21%
	Peri-urban	324	61%	39%
	Rural	216	81%	19%

- Considering most of the interviews were conducted on week days, the last trading day for over two-third of the total respondents was a weekday.

B6b: High Level of Business Patronage

		N	Morning (8am – 11:59am)	Afternoon (12noon – 4:59pm)	Evening (5pm and afterwards)	Entire day
Total		702	11%	18%	27%	27%
Outlet	**Formal**	351	10%	19%	30%	26%
	Informal	351	13%	17%	25%	28%
State	**Lagos**	234	10%	17%	24%	26%
	Cross River	234	13%	12%	23%	19%
	Kano	234	11%	25%	35%	36%
Gender	**Male**	469	12%	19%	31%	30%
	Female	233	10%	15%	20%	21%
Urbanisation	**Urban**	162	12%	17%	26%	25%
	Peri-urban	324	13%	20%	28%	28%
	Rural	216	9%	16%	28%	27%

Note: This is a summary table on traders who reported 'high patronage' at the different times of the day. It is not a cross-tabulation. Hence, neither row nor column percentage will sum up to 100%. In other words, the table simply picked the columns on 'High' in tables B6 – Morning, Afternoon, Evening and the Entire day.

- 11% of the traders reported high patronage in the morning, 18% reported high patronage in the afternoon, 27% reported high patronage in the evening. In the entire day, high patronage could be said to be 27%. Findings on how additional electricity would influence the business are reported in section F.
- Traders in Kano state seem to sell more in the afternoon, and likewise in the evening. As a matter of fact, Kano traders reported the highest of high business patronage for the entire day, whereas Cross River state reported lowest for the entire day (19%).
- In the rural areas, although high level of business patronage is not very impressive in the morning (9%) and afternoon (16%), the evening seems to be good (28%) and makes the entire day the same level among all traders (27%).

B6b: Level of Business Patronage at different times of the day among all traders

		N	Low	Medium	High
Total	**Morning (8am – 11:59am)**	702	48%	40%	11%
Total	**Afternoon (12noon – 4:59pm)**	702	28%	54%	18%
Total	**Evening (5pm and afterwards)**	702	26%	47%	27%
Total	**Entire day**	702	22%	51%	27%

Note: This is a summary table on what all the traders who reported 'either low or medium or high' at the different times of the day.

- The feedback from majority of the traders is that business patronage is low in the morning. This was reported by 48% of the traders. Most of the traders (54%) affirmed that business patronage is average in the afternoon, likewise evening (47% of the traders confirmed this). For the entire day, the report from majority of the traders (51%) is that business patronage is on the average.

Table B6: Average level of patronage in the Morning (8am – 11:59am)

		N	Low	Medium	High
Total		702	48%	40%	11%
Outlet	**Formal**	351	46%	44%	10%
	Informal	351	50%	37%	13%
State	**Lagos**	234	47%	44%	10%
	Cross River	234	47%	40%	13%
	Kano	234	51%	38%	11%
Gender	**Male**	469	47%	41%	12%
	Female	233	50%	40%	10%
Urbanisation	**Urban**	162	43%	45%	12%
	Peri-urban	324	48%	40%	13%
	Rural	216	52%	38%	9%

- Many of the traders record low patronage in the morning. 5 out of every 10 outlet in rural region reported this; a similar trend was observed in Kano, among females and informal outlet.

Table B6: Average level of patronage in the Afternoon (12noon – 4:59pm)

		N	Low	Medium	High
Total		702	28%	54%	18%
Outlet	**Formal**	351	26%	55%	19%
	Informal	351	29%	54%	17%
State	**Lagos**	234	22%	62%	17%
	Cross River	234	35%	53%	12%
	Kano	234	26%	48%	25%
Gender	**Male**	469	26%	54%	19%
	Female	233	30%	54%	15%
Urbanisation	**Urban**	162	31%	51%	17%
	Peri-urban	324	26%	54%	20%
	Rural	216	27%	57%	16%

- Over 50% of the traders reported average patronage in the afternoon. 6 out of every 10 traders in Lagos reported this trend.

Table B6: Average level of patronage in the Evening (5pm and afterwards)

		N	Low	Medium	High
Total		702	26%	47%	27%
Outlet	**Formal**	351	23%	47%	30%
	Informal	351	28%	46%	25%
State	**Lagos**	234	22%	54%	24%
	Cross River	234	35%	41%	23%
	Kano	234	21%	44%	35%
Gender	**Male**	469	23%	46%	31%
	Female	233	32%	48%	20%
Urbanisation	**Urban**	162	28%	46%	26%
	Peri-urban	324	27%	45%	28%
	Rural	216	23%	50%	28%

- Over 40% of the traders reported medium patronage in the evening. 5 out of every 10 traders in Lagos reported this trend, likewise traders in the rural region.

Table B6: Average level of patronage in the entire day

		N	Low	Medium	High
Total		702	22%	51%	27%
Outlet	**Formal**	351	20%	54%	26%
	Informal	351	23%	48%	28%
State	**Lagos**	234	18%	56%	26%
	Cross River	234	31%	50%	19%
	Kano	234	15%	48%	36%
Gender	**Male**	469	19%	51%	30%
	Female	233	27%	52%	21%
Urbanisation	**Urban**	162	22%	54%	25%
	Peri-urban	324	23%	49%	28%
	Rural	216	19%	53%	27%

- Half of the respondents reported medium patronage for an entire working day.

Table B6: Average Value of Sales at different Times of the Day for the Last Trading Day

			Average Value of Sales (Naira)			
			Morning (8am – 11:59am)	Afternoon (12 noon – 4:59am)	Evening (5 pm and afterwards)	Entire day
Total		**N**	702	702	702	702
		Mean	4,607	5,748	6,191	16,547
		S.D	5,370	8,222	8,965	20,458
Outlet	**Formal**	**N**	351	351	351	351
		Mean	5,793	7,588	8,364	21,745
		S.D	6,982	9,964	11,264	25,983
	Informal	**N**	351	351	351	351
		Mean	3,422	3,908	4,018	11,348
		S.D	2,488	5,414	4,964	10,439
State	**Lagos**	**N**	234	234	234	234
		Mean	4,406	5,521	5,811	15,738
		S.D	4,636	7,046	7,344	17,082
	Cross River	**N**	234	234	234	234
		Mean	4,966	5,381	6,341	16,688
		S.D	5,117	4,727	6,820	15,541
	Kano	**N**	234	234	234	234
		Mean	4,449	6,342	6,422	17,214
		S.D	6,235	11,438	11,881	26,921
Gender	**Male**	**N**	469	469	469	469
		Mean	4,902	6,326	6,833	18,061
		S.D	6,129	9,701	10,555	23,915
	Female	**N**	233	233	233	233
		Mean	4,015	4,584	4,900	13,499
		S.D	3,289	3,519	3,951	9,849
Urbanisation	**Urban**	**N**	162	162	162	162
		Mean	7,073	9,543	9,218	25,833
		S.D	8,853	13,622	12,718	33,235
	Peri-urban	**N**	324	324	324	324
		Mean	3,787	4,719	5,560	14,066
		S.D	2,786	5,289	8,304	13,355
	Rural	**N**	216	216	216	216
		Mean	3,989	4,447	4,868	13,304
		S.D	4,206	5,028	5,300	13,592

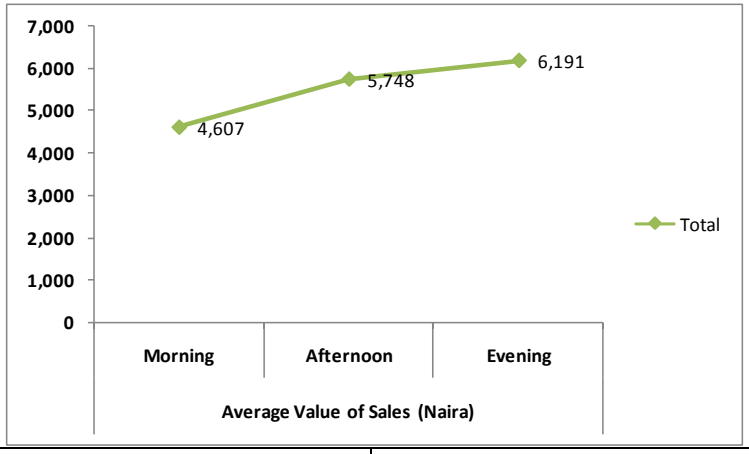
- The average sales in the morning was determined to be N 4,607. Formal outlets (N 5,793) make more than this general mean. Kano recorded more sales in the morning (N 6,235). The morning business patronage is also higher in the urban areas (N 7,073) than other settings. The male traders reported slightly higher mean sales (N 4,902) than the female traders (N4,015)

- Sales in the afternoon and evening are quite close. While a mean of N 5,748 was recorded in the afternoon, N 6,191 was recorded in the evening. The same trend of formal oulets, making

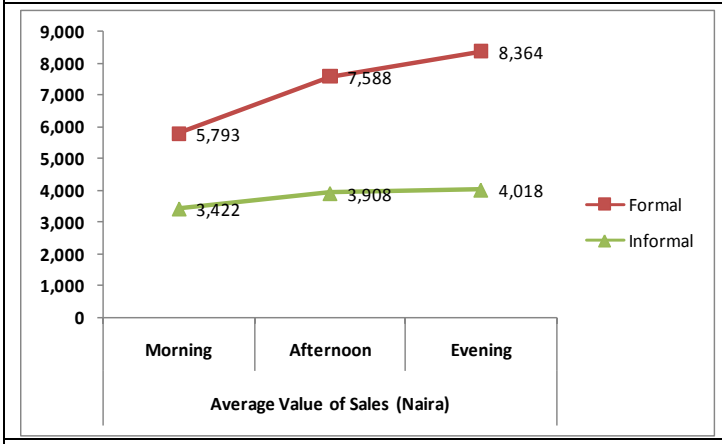
more than the informal, Kano makes more than other states, males make higher than females and urban settings make more than rural and peri-urban was observed.

- For the entire day, a mean sales of N 16,547 was reported among all traders, while the trend remained the same, it is worth mentioning that formal outlets sell twice as much as informal outlets, Kano traders sell almost twice as much as Lagos traders, outlets in urban areas sell practically twice as much as outlets in rural settings.
- The next charts show the trend of patronage at different periods of the day.

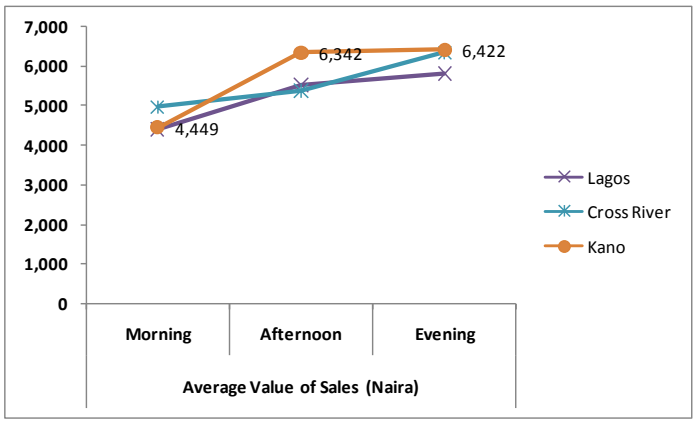
Table B6: Average Value of Sales at different Times of the Day for the Last Trading Day



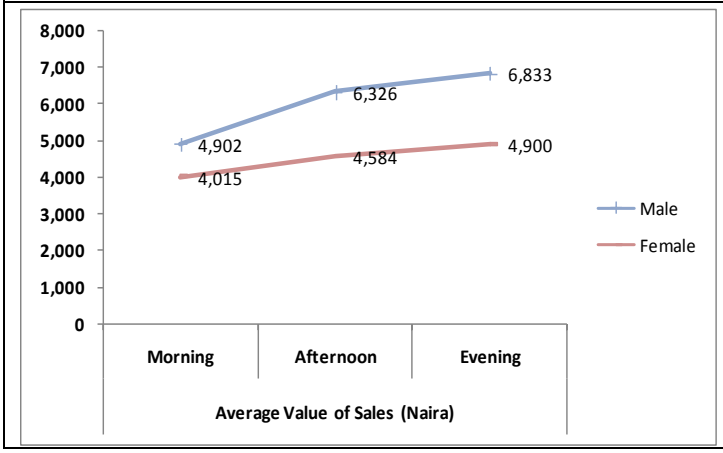
Outlets



States



Gender



Urbanisation

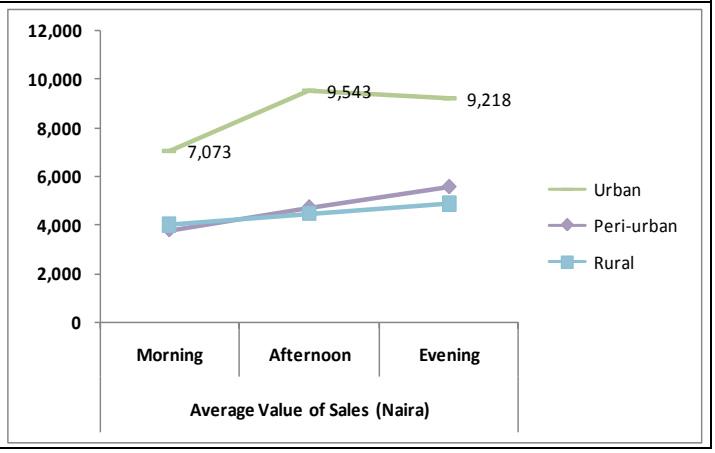


Table B7: Was the level of patronage' for last trading day' similar to other days in the store?

		N	Yes	No
Total		702	53%	47%
Outlet	**Formal**	351	56%	44%
	Informal	351	51%	49%
State	**Lagos**	34	63%	37%
	Cross River	234	46%	54%
	Kano	234	51%	49%
Gender	**Male**	469	51%	49%
	Female	233	58%	42%
Urbanisation	**Urban**	162	55%	45%
	Peri-urban	324	52%	48%
	Rural	216	54%	46%

- Over half of the traders reported that their level of patronage for the last trading day is similar to other days in their store.

Table B8: Level of Business Patronage for last trading day, compared to other days (If not similar).

		N	More	Less	Same
Total		328	41%	34%	24%
Outlet	**Formal**	155	43%	36%	21%
	Informal	173	40%	32%	28%
State	**Lagos**	86	21%	51%	28%
	Cross River	127	42%	31%	28%
	Kano	115	57%	25%	18%
Gender	**Male**	229	45%	34%	22%
	Female	99	34%	35%	30%
Urbanisation	**Urban**	73	52%	33%	15%
	Peri-urban	155	35%	37%	28%
	Rural	100	44%	30%	26%

- About 40% of the traders who reported that their level of patronage for the last trading day is not similar to other days in their store said patronage is usually more on other days. 52% of the traders in the urban areas confirmed this, and 57% of the traders in Kano confirmed this. Lagos seemed to be the lowest in this regards; 21%. 51% of the Lagos traders reported 'less'.

Table B9: Is there normally a difference in levels of patronage at different times of the day in the store?

		N	Yes	No
Total		702	48%	52%
Outlet	**Formal**	351	40%	60%
	Informal	351	55%	45%
State	**Lagos**	234	42%	58%
	Cross River	234	49%	51%
	Kano	234	52%	48%
Gender	**Male**	469	50%	50%
	Female	233	43%	57%
Urbanisation	**Urban**	162	63%	37%
	Peri-urban	324	43%	57%
	Rural	216	44%	56%

- 48% of the traders reported that there is normally a difference in the levels of patronage at different times of the day in the store. 6 out of every 10 traders in the urban region reported this trend.

Fig. B7: Was the level of patronage' for last trading day' similar to other days in the store?

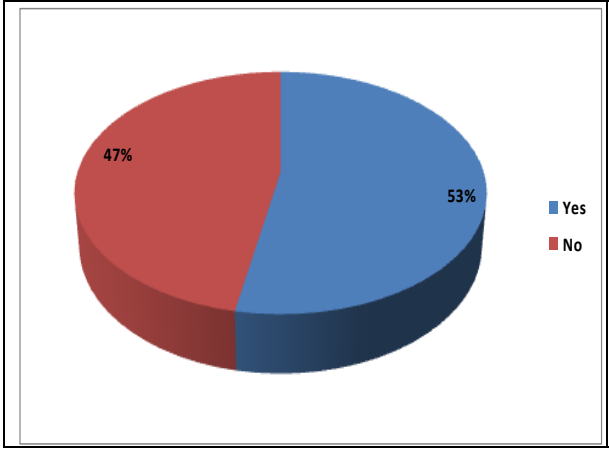


Fig. B9: Is there normally a difference in levels of patronage at different times of the day in the store?

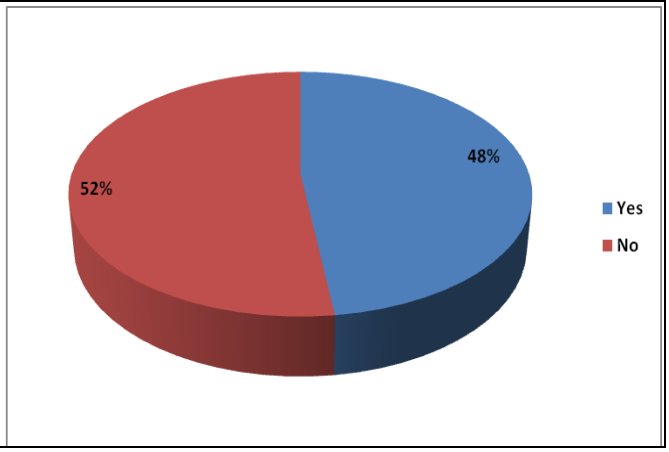


Table B10: The differences in levels of patronage at different times of the day

	Outlet			State			Gender		Urbanisation		
	N	Formal	Informal	Lagos	Cross River	Kano	Male	Female	Urban	Peri-urban	Rural
Total	334	142	192	99	114	121	234	100	102	138	94
Not consistent/fluctuates	31%	27%	34%	52%	29%	17%	28%	38%	25%	36%	31%
Higher in the evening	11%	13%	10%	7%	14%	12%	12%	8%	12%	9%	13%
Higher in the morning and evening	9%	12%	7%	6%	10%	12%	10%	7%	7%	11%	10%
Higher in the morning and afternoon	4%	4%	4%	2%	6%	3%	5%	2%	7%	4%	1%
Higher in the morning	5%	5%	6%	2%	10%	4%	5%	6%	5%	7%	4%
Higher in the afternoon only	13%	11%	14%	11%	7%	20%	12%	14%	15%	14%	9%
Higher during the weekends	8%	8%	7%	11%	9%	4%	5%	15%	14%	7%	3%
Patronage is low all day	3%	3%	4%	0%	2%	7%	4%	2%	4%	4%	2%
D K/Can't really say	15%	17%	14%	9%	14%	21%	18%	8%	12%	9%	28%

- Many of the traders that reported that there is normally a difference in the levels of patronage at different times of the day in the store, said patronage are not consistent/fluctuate.
- 3 out of every 10 retailers in informal outlet and peri-urban /rural region reported this same trend as well as the females.

Table B10: The reason for the differences in levels of patronage at different times of the day

	Outlet			State			Gender		Urbanisation		
	Total	Formal	Informal	Lagos	Cross River	Kano	Male	Female	Urban	Peri-urban	Rural
N	334	142	192	99	114	121	234	100	102	138	94
It depends on the opening of the market.	13%	17%	10%	3%	11%	24%	15%	8%	8%	17%	14%
Customers patronize in the morning, afternoon and evening.	19%	17%	20%	15%	22%	19%	18%	21%	25%	17%	15%
There are more sales on market days.	6%	6%	5%	1%	10%	6%	7%	3%	3%	5%	10%
More patronage during festive seasons/weekends.	9%	8%	9%	13%	7%	7%	8%	11%	9%	7%	12%
Due to lightening/there is comfort/conveniency.	3%	6%	1%	2%	4%	2%	3%	4%	1%	4%	3%
Customer/choice/wants/demands/quest	13%	5%	19%	22%	10%	9%	11%	18%	8%	13%	19%
Time/Sales of goods varies.	5%	4%	5%	6%	5%	3%	4%	6%	7%	5%	2%
Available product/customer services.	1%	0%	2%	0%	0%	2%	1%	0%	0%	1%	1%
Increase in sales.	0%	1%	0%	0%	1%	0%	0%	1%	0%	1%	0%
Don't know/Can't really say.	31%	37%	28%	37%	31%	27%	33%	28%	39%	30%	24%

- 13% of the traders each reported that difference in levels of patronage at different times of the day is due to opening of the market and customers' choice, wants, demands as well as request.

Table B11: Does the availability of good lighting/ electricity play any role in determining the level of patronage at certain times of the day?

		N	Yes	No
Total		702	58%	42%
Outlet	**Formal**	351	62%	38%
	Informal	351	54%	46%
State	**Lagos**	234	64%	36%
	Cross River	234	53%	47%
	Kano	234	57%	43%
Gender	**Male**	469	58%	42%
	Female	233	58%	42%
Urbanisation	**Urban**	162	62%	38%
	Peri-urban	324	60%	40%
	Rural	216	52%	48%

- Over half of the traders reported that availability of good lighting/ electricity play a role in determining the level of patronage at certain times of the day.

Fig. B11: Does the availability of good lighting/ electricity play any role in determining the level of patronage at certain times of the day?

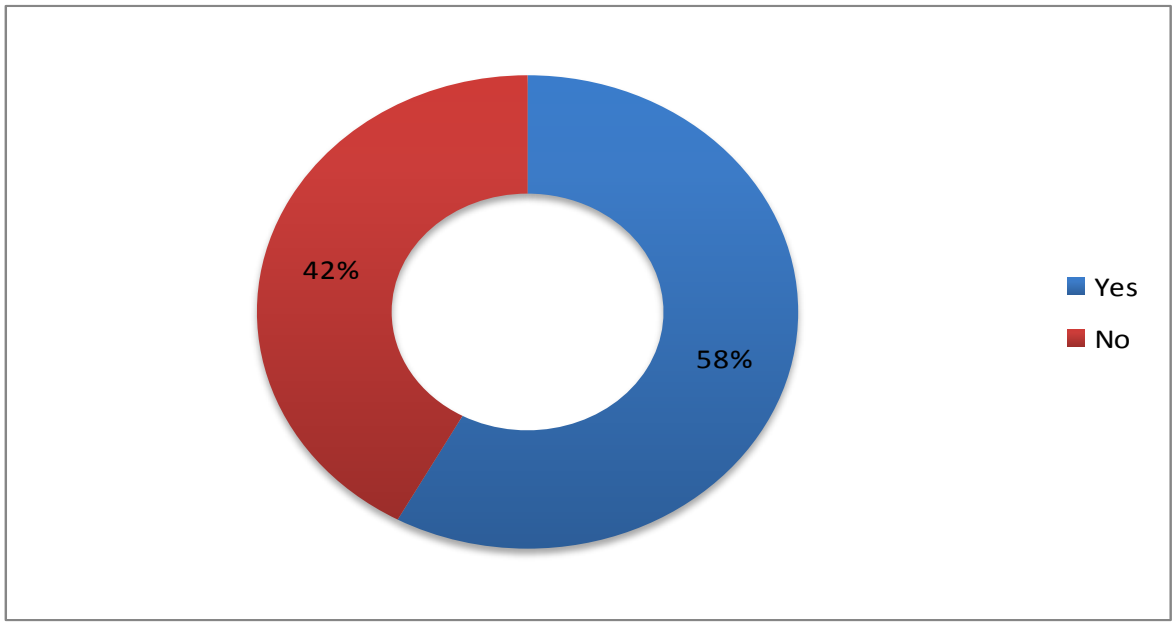


Table B12: The role availability of good lighting/electricity plays in determining the level of patronage in the store

	Outlets			State			Gender		Urbanisation		
	Total	Formal	Informal	Lagos	Cross River	Kano	Male	Female	Urban	Peri-urban	Rural
N	406	216	190	149	123	134	272	134	101	193	112
Without light, there is less sales/patronage	11%	12%	11%	13%	6%	14%	14%	7%	7%	13%	13%
Availability of good lighting attracts customers/sales/improve service	66%	67%	65%	73%	66%	57%	61%	75%	78%	61%	63%
Availability of light makes customers comfortable/relaxed	8%	9%	8%	3%	10%	13%	10%	5%	7%	8%	10%
Availability of light extends stay/longer hours at shop	5%	5%	6%	2%	11%	4%	5%	6%	4%	6%	4%
Availability of light preserves goods	0%	1%	0%	0%	1%	1%	1%	0%	1%	0%	1%
Availability of light reduces the cost of alternative sources	1%	1%	1%	0%	2%	1%	1%	1%	0%	1%	2%
Availability of light ensures proper security	1%	0%	2%	0%	0%	2%	1%	0%	0%	1%	1%
Don't know/Can't really say	7%	6%	8%	8%	6%	7%	7%	7%	3%	9%	7%

- 'Attracting customers, improving sales and service' was reported by about two-third of the traders as a role availability of good electricity play in determining the level of patronage in the store. 1 out of every 10 traders mentioned that without light, there is less sales/patronage in the store.

Table B13: Average Weekly Expense on Stocking the Shop

			Average Weekly Expense on Stocking the Shop (Naira)			
		N	Mean	S.D	Minimum	Maximum
Total		412	49,757	83,467	2,000	500,000
Outlet	**Formal**	225	68,444	100,528	2,000	500,000
	Informal	187	27,273	47,884	2,000	500,000
State	**Lagos**	160	42,325	59,366	2,000	500,000
	Cross River	92	66,418	83,958	3,000	500,000
	Kano	160	47,609	101,137	2,000	500,000
Gender	**Male**	282	52,401	87,980	2,000	500,000
	Female	130	44,023	72,710	2,000	500,000
Urbanisation	**Urbanisation**	86	93,523	136,402	2,000	500,000
	Peri-urban	205	42,427	61,973	2,000	500,000
	Rural	121	31,070	48,334	2,000	400,000

- Traders generally spend an average of N 49,757 weekly, to stock their shop.
- Traders with formal outlets spend almost as thrice as traders with informal outlets to stock their shops every week.
- Comparing the 3 states in focus, traders in Cross River reported spending highest (N 66,418) in stocking their shops weekly, followed by traders in Kano (N 47,609). Lagos traders reported the lowest amount (N 42,325) in weekly stocking of shop.
- Male traders spend more in stocking their shops weekly (N 52,401) than the female traders (N 44,023).
- It is not surprising that traders in the urban areas spend more than twice than the traders in the peri-urban areas in stocking their shops weekly, and about thrice the amount spent by the traders in the rural areas.

Table B14: Additional Costs incurred monthly in running the business

			RENT	TRANSPORTATION	SECURITY LEVY	ENVIRONMENTAL /SANITATION FEE
Total		**N**	399	289	341	319
		Mean	4,235	2,396	715	705
		S.D	3,744	2,832	1,080	1,181
Outlet	**Formal**	**N**	208	142	215	189
		Mean	4,765	3,097	834	873
		S.D	3,848	3,420	1,190	1,299
	Informal	**N**	191	147	126	130
		Mean	3,657	1,718	511	460
		S.D	3,549	1,893	825	937
State	**Lagos**	**N**	129	98	162	115
		Mean	4,389	2,522	954	1,149
		S.D	3,724	2,975	1,244	1,537
	Cross River	**N**	165	117	123	159
		Mean	2,951	2,520	406	414
		S.D	2,808	2,492	730	809
	Kano	**N**	105	74	56	45
		Mean	6,062	2,032	699	600
		S.D	4,259	3,134	1,054	880
Gender	**Male**	**N**	248	176	204	191
		Mean	4,445	2,385	807	666
		S.D	3,948	2,757	1,119	1,029
	Female	**N**	151	113	137	128
		Mean	3,889	2,412	577	763
		S.D	3,368	2,956	1,006	1,380
Urbanisation	**Urban**	**N**	100	74	89	77
		Mean	6,450	2,842	983	1,218
		S.D	3,499	3,072	1,422	1,606
	Peri-urban	**N**	173	131	154	152
		Mean	3,707	2,050	681	600
		S.D	3,589	2,111	968	985
	Rural	**N**	126	84	98	90
		Mean	3,201	2,542	524	443
		S.D	3,440	3,486	818	906

- Excluding energy or power related issues, additional costs incurred monthly by traders in running their business majorly include rent, transportation, security levy and environmental/sanitation fee, with average monthly amount of N 4,235, N 2,396, N 1,080 and N 1,181 respectively.
- Formal outlets generally spend more on all of these than informal outlets. Similarly for outlets in the urban areas compared to peri-urban or rural areas.
- Lagos traders spend more on transportation, security levy and environmental/sanitation fee. Higher rent fees were reported in Kano (N6,062) than Lagos (N4,389).
- While the male traders reported spending more on rent (N4,445) and security levy (N807), the female traders reported spending more on transportation (N2,412) and environmental/sanitation fee (N763).

Table B16: Are there laws governing the activities of this trading location?

		N	Yes	No
Total		702	40%	60%
Outlet	**Formal**	351	40%	60%
	Informal	351	39%	61%
State	**Lagos**	234	41%	59%
	Cross River	234	44%	56%
	Kano	234	34%	66%
Gender	**Male**	469	41%	59%
	Female	233	38%	62%
Urbanisation	**Urban**	162	62%	38%
	Peri-urban	324	33%	67%
	Rural	216	33%	67%

- It was reported by 62% of the traders that trading locations in urban region have laws governing their activities. 33% traders reported same in peri-urban and 33% in the rural region.
- Overall, only 40% of the traders reported that there are laws governing the activities of their trading location.

Table B17: Laws that exists in the market

		N	Opening and closing time/Females closing time	Environmental laws/cleanliness of the environment	Bad products/Animals are not allowed/no selling of drugs intoxicant	Market laws/market meetings	Peace and order	Payment of revenue and sanitation fee	Don't know/Can't really say
Outlet	**Total**	279	43%	38%	0%	5%	9%	3%	3%
	Formal	142	55%	30%	0%	3%	8%	1%	3%
	Informal	137	30%	47%	1%	7%	9%	4%	2%
State	**Lagos**	96	28%	67%	0%	0%	0%	0%	5%
	Cross River	104	26%	38%	0%	7%	23%	7%	0%
	Kano	79	82%	5%	1%	9%	0%	0%	3%
Gender	**Male**	190	49%	32%	1%	5%	8%	3%	2%
	Female	89	29%	52%	0%	6%	9%	1%	3%
Urbanisation	**Urban**	101	53%	30%	0%	11%	0%	4%	2%
	Peri-urban	106	45%	39%	0%	1%	12%	2%	1%
	Rural	72	24%	50%	1%	3%	15%	1%	6%

- Opening and closing time as well as females closing time was reported by 43% of the traders as one of the market laws. Over one-third of the traders mentioned environmental laws and cleanliness of the environment.

Table B18: Do these laws restrict or limit your activities and/or trading hours?

		N	Yes	No
Total		279	49%	51%
Outlets	**Formal**	142	44%	56%
	Informal	137	55%	45%
State	**Lagos**	96	73%	27%
	Cross River	104	38%	63%
	Kano	79	35%	65%
Gender	**Male**	190	44%	56%
	Female	89	61%	39%
Urbanisation	**Urban**	101	57%	43%
	Peri-urban	106	42%	58%
	Rural	72	47%	53%

- Many traders in Lagos have issues with the market laws governing their activities as 73% of those who reported these laws said the laws restrict or limit their activities and/or trading hours.
- Just like 61% of the female traders are reporting what the Lagosians are saying, traders in urban region (57%) are not left out.

Table B19: How trading laws restrict or limit traders' activities and/or trading hours

		N	Limits opening and closing hour	Less patronage/customer prefer late shopping	Government restriction/Tax defaulters	Security/Electricity not in the market	Only twice a week	DK/can't really say
Total		137	84%	7%	1%	1%	2%	5%
Outlet	**Formal**	62	76%	10%	2%	0%	5%	8%
	Informal	75	91%	4%	1%	1%	0%	3%
State	**Lagos**	70	83%	6%	1%	0%	4%	6%
	Cross River	39	92%	0%	3%	3%	0%	3%
	Kano	28	75%	18%	0%	0%	0%	7%
Gender	**Male**	83	83%	5%	2%	1%	2%	6%
	Female	54	85%	9%	0%	0%	2%	4%
Urbanisation	**Urban**	58	78%	9%	3%	2%	0%	9%
	Peri-urban	45	87%	7%	0%	0%	4%	2%
	Rural	34	91%	3%	0%	0%	3%	3%

- Over 70% of the traders having issues with the laws governing their activities reported that it limits opening and closing hour.
- While 18% of the traders reported that the law will bring less patronage as customers prefer late shopping, those in Calabar (92%) believe solely that it majorly limits opening and closing hour.

Table B20: Do these laws restrict or limit the type of electricity sources you can use in this trading location?

		N	Yes	No
Total		279	10%	90%
Outlet	**formal**	142	8%	92%
	Informal	137	12%	88%
State	**Lagos**	96	14%	86%
	Cross River	104	4%	96%
	Kano	79	14%	86%
Gender	**Male**	190	9%	91%
	Female	89	11%	89%
Urbanisation	**Urban**	101	14%	86%
	Peri-urban	106	10%	90%
	Rural	72	4%	96%

- Very few traders (10%) reported the laws governing their activities restrict or limit the type of electricity sources.

Table B22: Average Daily Estimate of Sales in the Business

			Average Daily Estimate of Sales in the Business (Naira)			
		N	**Mean**	**S.D**	**Minimum**	**Maximum**
Total		660	16,778	27,548	600	200,000
Outlet	**Formal**	327	21,617	32,336	1,000	200,000
	Informal	333	12,027	20,830	600	150,000
State	**Lagos**	219	14,650	20,963	1,000	150,000
	Cross River	228	15,355	19,626	600	150,000
	Kano	213	20,489	38,392	800	200,000
Gender	**Male**	441	18,843	31,722	600	200,000
	Female	219	12,621	15,396	1,000	150,000
Urbanisation	**Urbanisation**	153	31,383	44,765	1,500	200,000
	Peri-urban	307	12,613	18,184	1,000	150,000
	Rural	200	11,999	16,134	600	150,000

- The average daily estimates of sales of the traders was generally determined to be N16,778. This ranged from N600 to N200,000 per day.
- Kano recorded the highest daily sales (N 20,489) than Cross River (N 15,355) and Lagos (N14,650). Male traders reported higher daily sales (N18,843) than the female traders (N12,621).
- Daily sales from outlets in the urban areas are almost thrice as much as the sales recorded in the peri-urban and rural outlets.

Section C: Source of Power and Power Usage

Table C1: Are you connected to the main grid electricity (PHCN)?

		N	Yes	No
Total		702	62%	38%
Outlet	**Formal**	351	72%	28%
	Informal	351	53%	47%
State	**Lagos**	234	76%	24%
	Cross River	234	59%	41%
	Kano	234	52%	48%
Gender	**Male**	469	61%	39%
	Female	233	64%	36%
Urbanisation	**Urban**	162	60%	40%
	Peri-urban	324	68%	32%
	Rural	216	55%	45%

- More than 70% of the traders in formal outlets (72%) and in Lagos (76%) are connected to the main grid electricity (PHCN).
- It appears outlets in peri-urban (68%) are connected more to the main grid electricity as compared to those in urban (60%) and rural (55%).
- On the overall, connection of respondents to the main grid electricity stands at 62%.

Fig C1: Are you connected to the main grid electricity (PHCN)?

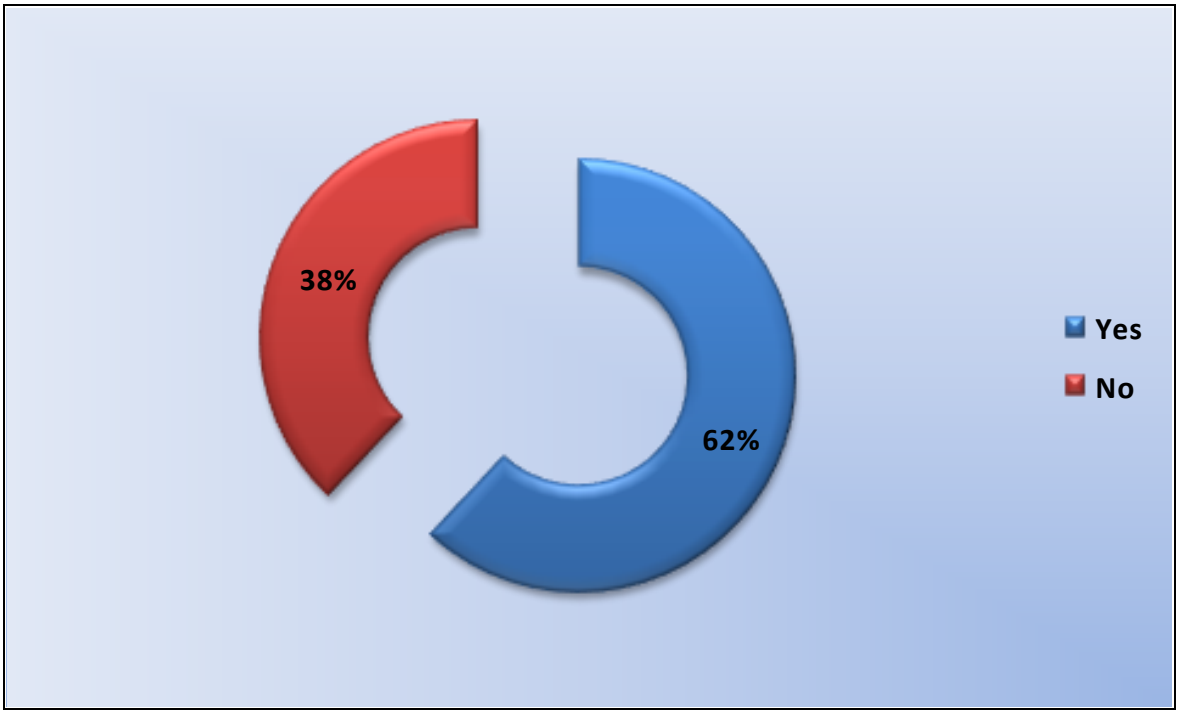


Table C2: Reason for not connecting to the main electricity grid

		N	No light/Irregular electricity/high charges	Electricity not allowed in the market due to fire/market law	Not necessary for my business/close early	No electricity connection in the area/bad transformer/poles	Don't know/Can't really say
Total		265	33%	22%	12%	25%	9%
Outlet	**Formal**	100	32%	26%	9%	25%	8%
	Informal	165	33%	19%	15%	24%	9%
State	**Lagos**	56	30%	23%	16%	16%	14%
	Cross River	97	34%	31%	6%	22%	7%
	Kano	112	33%	13%	16%	31%	7%
Gender	**Male**	182	32%	20%	13%	26%	9%
	Female	83	35%	24%	12%	20%	8%
Urbanisation	**Urban**	64	34%	17%	16%	22%	11%
	Peri-urban	104	32%	21%	10%	26%	12%
	Rural	97	33%	25%	13%	25%	4%

- Irrespective of the outlet, state, gender and location, about one-third of the traders reported that no light, irregular electricity and high charges as the reasons they are not connected to the main electricity grid, while 25% of the traders reported that their reason is no electricity connection in the area and bad transformer/poles.

Table C3: Do you expect to be connected to the grid in the next 6 months?

		N	Yes	No
Total		265	24%	76%
Outlet	**Formal**	100	20%	80%
	Informal	165	27%	73%
State	**Lagos**	56	25%	75%
	Cross River	97	8%	92%
	Kano	112	38%	63%
Gender	**Male**	182	27%	73%
	Female	83	18%	82%
Urbanisation	**Urban**	64	27%	73%
	Peri-urban	104	19%	81%
	Rural	97	28%	72%

- Among the traders who are not connected to the main grid electricity, about a quarter of the traders expect to be connected to the grid in the next 6 months.
- While this trend is quite high in Kano state (38%), traders in Cross River (8%) do not see themselves getting connected in the next 6 months.

Table C4: Reason for believing that they will be connected to the grid in the next 6 months

		N	Regular power supply	To develop business and increase income	Hoping/expecting change/if repaired	There is improvement/repair is going on	To get less expenses	Anytime comfortable/when I have money/if it affect sales	Don't know/Can't really say
Total		64	17	14	7	13	4	3	6
Outlet	**Formal**	20	5	4	4	2	2	0	3
	Informal	44	12	10	3	11	2	3	3
State	**Lagos**	14	7	1	1	1	0	3	1
	Cross River	8	1	2	0	0	2	0	3
	Kano	42	9	11	6	12	2	0	2
Gender	**Male**	49	13	10	6	13	1	0	6
	Female	15	4	4	1	0	3	3	0
Urbanisation	**Urban**	17	1	6	0	5	2	2	1
	Peri-urban	20	4	4	4	4	2	1	1
	Rural	27	12	4	3	4	0	0	4

- 17 out of the 64 traders reported that there is now regular power supply and so they believe that they will be connected to the grid in the next six month. Interestingly, 12 out of the traders each are from the rural region and trade in informal outlets. 13 of the traders are male.

Table C5: Average Amount Traders have to pay to be connected to the Main grid

			Average Cost of Connecting to the Main grid (Naira)			
		N	Mean	S.D	Minimum	Maximum
Total		89	942	742	100	5,000
Outlet	**Formal**	27	1,222	1,066	100	5,000
	Informal	62	819	510	100	3,000
State	**Lagos**	19	800	764	200	3,000
	Cross River	18	1,011	846	200	3,500
	Kano	52	969	704	100	5,000
Gender	**Male**	68	990	738	100	5,000
	Female	21	786	753	100	3,000
Urbanisation	**Urban**	24	867	490	100	2,000
	Peri-urban	33	1,033	906	200	5,000
	Rural	32	903	723	100	3,500

- The average amount traders have to pay to get connected to the main grid of electricity was determined to be N 942. This ranged from N100 to N5,000.
- Among the states, this costs appeared to be highest in Cross River (N1,011) and the male traders reported a higher amount (N 990) than the female traders (N786), and highest among the outlets in the peri-urban (N1,033).

Table C6: Do you require electricity for your business ?

		N	Yes	No
Total		702	79%	21%
Outlet	**Formal**	351	83%	17%
	Informal	351	75%	25%
State	**Lagos**	234	84%	16%
	Cross River	234	74%	26%
	Kano	234	79%	21%
Gender	**Male**	469	80%	20%
	Female	233	77%	23%
Urbanisation	**Urban**	162	85%	15%
	Peri-urban	324	78%	22%
	Rural	216	75%	25%

- More than three-quarter of the traders require electricity for their business.
- It can be deduced from table C2 and C6 that some traders are connected to electricity but do not necessarily need it for their business.
- Many of the traders in formal outlets (83%), in Lagos (84%) and in urban region (85%) require electricity for their business.

Table C6a: Kind of businesses that require electricity to keep the running.

	Total Number of Traders	Number Traders that requires Electricity
Products/Goods		
Electrical Appliance/Electronics	80	75 (94%)
Fresh foods	20	17 (85%)
Other food	46	37 (80%)
Care Products/Pharmaceuticals	64	51 (80%)
FMCG	198	143 (72%)
Clothes/Shoes/Bags	172	120 (70%)
Others	83	74 (89%)
Services		
Hair Dressing/Barbing	64	63 (98%)
Tailoring	70	62 (89%)
Food Vending	84	63 (75%)
Others	17	16 (94%)

- Generally, 94% of the traders who sell electrical appliances/electronics said they require electricity for their business. Same was reported by 85% of the traders who sell fresh foods, 80% of the traders selling other food products, 80% of the traders who sell care products/pharmaceuticals, 72% of the FMCG traders and 70% of the traders who sell clothes/shoes/bags.

- For services on the other hand, nearly all the hair dressers and barbers (98%) reported they require electricity. 89% of the tailors reported the same, likewise 75% of food vendors.

Table C7a: Minimum number of hours of electricity needed per day to keep the business running

			Minimum Number of Hours of Electricity Needed per Day to keep the business running			
		N	Mean	S.D	Minimum	Maximum
Total		609	9	4.37	1	24
Outlet	**Formal**	316	9	4.54	1	24
	Informal	293	8	4.16	1	24
State	**Lagos**	210	8	3.61	1	24
	Cross River	175	9	5.77	1	24
	Kano	224	9	3.68	1	24
Gender	**Male**	424	9	4.55	1	24
	Female	185	8	3.88	1	24
Urbanisation	**Urbanisation**	142	8	3.07	1	24
	Peri-urban	288	9	4.85	1	24
	Rural	179	8	4.35	1	24

- Traders need minimum of 8 – 9 hours of electricity per day to keep the business running.

Table C7b: The minimum number of hours of power or electricity needed to keep business running

		N	< 4 hours	4 - 8 hours	9 - 12 hours	13 - 23 hours	24 hours
Total		609	7%	51%	33%	4%	4%
Outlet	**Formal**	316	5%	48%	37%	4%	5%
	Informal	293	9%	55%	30%	4%	3%
State	**Lagos**	210	4%	59%	32%	3%	2%
	Cross River	175	13%	44%	31%	3%	9%
	Kano	224	5%	50%	37%	5%	2%
Gender	**Male**	424	7%	48%	35%	4%	5%
	Female	185	7%	58%	29%	3%	3%
Urbanisation	**Urban**	142	4%	58%	36%	1%	1%
	Peri-urban	288	7%	47%	36%	4%	6%
	Rural	179	9%	54%	28%	6%	3%

- At least, half of the traders need 4 – 8 hours to keep their business running.

- About one-third of the traders also reported that they need 9 – 12 hours to keep their business running.
- More than 10% of the traders in Cross River state reported they need less than 4 hours of light to keep their business running.

Table C7c: Kind of businesses that require over 8 hours of power to keep running

	Total Number of Traders	Traders that needs over 8 hours of Power
Products/Goods		
Electrical Appliance/Electronics	78	45 (58%)
Care Products/Pharmaceuticals	60	24 (40%)
Other food	38	15 (40%)
FMCG	165	63 (38%)
Fresh foods	17	6 (35%)
Clothes/Shoes/Bags	133	47 (35%)
Others	80	34 (43%)
Services		
Hair Dressing/Barbing	61	32 (52%)
Tailoring	60	24 (40%)
Food Vending	70	28 (40%)
Others	17	9 (53%)

- Generally, 58% of the traders who sell electrical appliances/electronics said they require over 8 hours of powers to keep their business running. Same was reported by 40% of the traders who sell care products/pharmaceuticals, 40% of the traders who sell other foods, 38% of the traders selling FMCG, 35% of the Fresh foods traders and 35% of the traders who sell clothes/shoes/bags.
- For services on the other hand, 52% of the hair dressers and barbers reported they require electricity for over 8 hours to keep the business running. 40% of the tailors reported the same, likewise 40% of food vendors.

Table C8a: Hours of electricity available on the last trading day (both Off-grid and On-grid)

			Hours of Electricity available on the last Trading Day			
		N	Mean	S.D	Minimum	Maximum
Total		667	3	4.04	0	24
Outlet	**Formal**	344	4	4.22	0	24
	Informal	323	3	3.82	0	24
State	**Lagos**	218	3	2.62	0	12
	Cross River	234	2	5.09	0	24
	Kano	215	5	3.59	1	20
Gender	**Male**	438	4	3.61	0	24
	Female	229	3	4.75	0	24
Urbanisation	**Urbanisation**	149	4	2.72	0	11
	Peri-urban	323	4	4.65	9	24
	Rural	195	3	3.67	0	24

- Generally, on the last trading day, traders had 3 hours of light, as against the minimum required of 9 hours.
- Of the 3 states, Cross River appeared to suffer most from unavailability of light (2 hours), while Kano reported as high as 5 hours.

Table C8b: The number of hours of power or electricity available for the last trading day (both Off-grid and On-grid)

		N	< 4 hours	4 - 8 hours	9 - 12 hours	13 - 23 hours	24 hours	DK/can't really say
Total		702	55%	34%	3%	1%	1%	5%
Outlet	**Formal**	351	55%	37%	4%	1%	2%	2%
	Informal	351	56%	32%	3%	1%	1%	8%
State	**Lagos**	234	42%	48%	3%	0%	0%	7%
	Cross River	234	81%	14%	0%	1%	4%	0%
	Kano	234	43%	41%	7%	2%	0%	8%
Gender	**Male**	469	54%	35%	4%	1%	0%	7%
	Female	233	59%	34%	2%	0%	3%	2%
Urbanisation	**Urban**	162	38%	50%	4%	0%	0%	8%
	Peri-urban	324	59%	34%	3%	2%	2%	0%
	Rural	216	63%	23%	2%	1%	1%	10%

- More than half (55%) of the traders reported that less than 4 hours of power was available for their last trading day. Traders from Cross River were most deprived of electricity, as 81% of the reported having electricity for less than 4 hours on their last trading days.
- About one-third of the traders (34%) reported 4 – 8 hours of power was available for their last trading day.

Table C9: Do you usually have more or less number of hours of power/electricity available?

		N	Normal situation	Usually less hours of power	Usually more hours of power
Total		702	22%	69%	9%
Outlet	**Formal**	351	24%	67%	9%
	Informal	351	19%	71%	10%
State	**Lagos**	234	23%	70%	8%
	Cross River	234	26%	65%	8%
	Kano	234	16%	72%	12%
Gender	**Male**	469	22%	69%	9%
	Female	233	22%	69%	9%
Urbanisation	**Urban**	162	14%	75%	11%
	Peri-urban	324	25%	68%	7%
	Rural	216	22%	66%	12%

- 69% of the traders reported usually having less hours of power.
- 71% of the traders in informal outlets reported that they usually have less hours of power. Three-quarter of the traders in urban region also reported this trend.

Table C10: Hours of Electricity that is normally available per day

			Hours of Electricity that is normally available per day			
		N	Mean	S.D	Minimum	Maximum
Total		669	3	3.69	0	22
Outlet	**Formal**	345	4	3.63	0	20
	Informal	324	3	3.76	0	22
State	**Lagos**	218	4	2.60	0	12
	Cross River	234	2	3.84	0	20
	Kano	217	5	3.87	1	22
Gender	**Male**	440	4	3.82	0	22
	Female	229	3	3.36	0	20
Urbanisation	**Urban**	150	4	2.90	0	11
	Peri-urban	323	4	4.20	0	22
	Rural	196	3	3.23	0	20

- Normally, the traders generally have electricity for 3 hours per day while Cross River has as low as 2 hours, Kano reported as high as 5 hours.

The table below presents a gap analysis of the hours of electricity normally available per day, compared to the minimum required.

		Hours of Electricity per day		
		Minimum required	Normally available	Gap Assessment
Total		9	3	6
Outlet	**Formal**	9	4	5
	Informal	8	3	5
State	**Lagos**	8	4	4
	Cross River	9	2	7
	Kano	9	5	4
Gender	**Male**	9	4	5
	Female	8	3	5
Urbanisation	**Urban**	8	4	4
	Peri-urban	9	4	5
	Rural	8	3	5

Table C11: Number of Days per Week that Electricity is normally available

			Number of Days per Week that Electricity that is normally available			
		N	Mean	S.D	Minimum	Maximum
Total		643	3	2.55	0	7
Outlet	**Formal**	334	3	2.47	0	7
	Informal	309	3	2.64	0	7
State	**Lagos**	210	4	2.31	0	7
	Cross River	220	2	1.97	0	7
	Kano	213	4	2.52	1	7
Gender	**Male**	423	4	2.56	0	7
	Female	220	3	2.49	0	7
Urbanisation	**Urban**	140	5	2.37	0	7
	Peri-urban	315	3	2.51	0	7
	Rural	188	3	2.51	0	7

- Generally, the traders have electricity for 3 days per week. While Cross River outlets reported as low as 2 days, Lagos and Kano reported 4 days.
- Outlets in the urban areas generally have light for as much as 5 days a week, whereas the peri-urban and rural reported 3 days a week.

Table C12: How lack of electricity affect the business

		N	No effect/ none/not at all	Time customer spends in the shop will be less	There will be no illumination	Low sales of goods/Non profit	Slightly affected	Ventilation/alternative power source	Don't know/Can't really say
Total		702	29%	13%	54%	1%	1%	0%	2%
Outlet	**Formal**	351	26%	15%	56%	1%	0%	0%	3%
	Informal	351	32%	11%	51%	1%	1%	0%	2%
State	**Lagos**	234	17%	9%	71%	0%	2%	0%	1%
	Cross River	234	37%	17%	44%	1%	0%	0%	1%
	Kano	234	33%	13%	47%	2%	0%	0%	5%
Gender	**Male**	469	29%	15%	51%	1%	0%	0%	3%
	Female	233	28%	10%	58%	0%	1%	0%	1%
Urbanisation	**Urban**	162	25%	13%	57%	4%	1%	0%	1%
	Peri-urban	324	30%	12%	55%	0%	0%	0%	2%
	Rural	216	31%	15%	49%	0%	1%	0%	4%

- Over half of the traders reported that lack of electricity brings lack of illumination.71% of the traders in Lagos reported this, likewise 58% of the female traders.
- A little above one quarter of the traders report otherwise saying there is no effect. 37% of these traders are in Cross-River.

Table C13: Has there been a change in the supply of power or electricity in the past 12 months?

		N	Yes	No
Total		702	39%	61%
Outlet	**Formal**	351	47%	53%
	Informal	351	31%	69%
State	**Lagos**	234	44%	56%
	Cross River	234	29%	71%
	Kano	234	44%	56%
Gender	**Male**	469	41%	59%
	Female	233	36%	64%
Urbanisation	**Urban**	162	40%	60%
	Peri-urban	324	38%	62%
	Rural	216	39%	61%

- While traders in Lagos (44%) reported a change in the supply of power or electricity in the past 12 months only 29% of the traders in Cross-River reported this.
- On the overall, 39% reported a change in the supply of power in the past 12 months, whereas 69% felt there was no change.

Table C14: Was this change an improvement or deterioration in the supply of power?

		N	Improvement	Deterioration
Total		274	65%	35%
Outlet	**Formal**	165	55%	45%
	Informal	109	79%	21%
State	**Lagos**	102	50%	50%
	Cross River	69	81%	19%
	Kano	103	68%	32%
Gender	**Male**	190	66%	34%
	Female	84	61%	40%
Urbanisation	**Urban**	65	75%	25%
	Peri-urban	124	65%	35%
	Rural	85	55%	45%

- 79% of the traders in informal outlets reported that the change in the supply of power/ electricity is that of improvement.
- While this was affirmed by 81% of the traders in Cross River and 75% of the traders in urban region, 50% of the traders in Lagos and 45% traders in the rural region reported otherwise saying that the change is that of deterioration.

Table C15i: Amount Traders pay/expect to pay monthly for Electricity (PHCN)

			Amount Traders pay/expect to pay monthly for Electricity (PHCN)			
		N	Mean	S.D	Minimum	Maximum
Total		479	950	1,056	100	8,000
Outlet	**Formal**	261	1,141	1,265	100	8,000
	Informal	218	722	667	100	6,000
State	**Lagos**	180	1,172	1,357	100	8,000
	Cross River	145	772	980	100	7,000
	Kano	154	860	575	100	5,000
Gender	**Male**	326	1,003	1,143	100	8,000
	Female	153	839	836	100	5,000
Urbanisation	**Urban**	118	1,127	1,154	100	5,000
	Peri-urban	238	953	1,103	100	8,000
	Rural	123	775	816	100	7,000

- Traders pay/expect to pay an average of N950 monthly for electricity (PHCN). This ranged from N100 to N8,000
- The expectation was higher among formal outlets (N 1,141) than informal outlets (N 722), higher among Lagos traders (N 1,172) than Kano (N 860) and Cross River (N 772), higher among male traders (N 1,003) than female traders (N 839), higher among urban traders (N 1,127) than peri-urban (N 953) and rural settings (N 775) .

Table C15ii: Amount Traders pay/expect to pay monthly for Off-grid Electricity

			Amount Traders pay/expect to pay monthly for Alternative Sources of Electricity			
		N	Mean	S.D	Minimum	Maximum
Total		447	2,173	3,877	100	30,000
Outlet	**Formal**	248	2,399	4,176	100	30,000
	Informal	199	1,891	3,458	100	25,000
State	**Lagos**	173	1,604	3,004	100	30,000
	Cross River	145	2,082	4,031	100	25,000
	Kano	129	3,038	4,557	100	30,000
Gender	**Male**	294	2,279	3,722	100	30,000
	Female	153	1,968	4,164	100	30,000
Urbanisation	**Urban**	111	2,567	4,889	100	30,000
	Peri-urban	207	2,192	3,814	100	30,000
	Rural	129	1,802	2,854	100	15,000

- Traders feel they should pay higher for off-grid electricity than the national grid. The average pay for off-grid was determined as N 2,173, although this ranged from as low as N100 to N30,000.

The table below shows how much more (cost difference) traders are willing to pay for alternative sources, and proportion of pay of alternative sources compared to main grid:

		Monthly pay/expectation (N)		Cost Difference (N)	Proportion
		Alternative	Main Grid		
Total		2,173	950	1,223	2.3
Outlet	**Formal**	2,399	1,141	1,258	2.1
	Informal	1,891	722	1,169	2.6
State	**Lagos**	1,604	1,172	432	1.4
	Cross River	2,082	772	1,310	2.7
	Kano	3,038	860	2,178	3.5
Gender	**Male**	2,279	1,003	1,276	2.3
	Female	1,968	839	1,129	2.3
Urbanisation	**Urban**	2,567	1,127	1,440	2.3
	Peri-urban	2,192	953	1,239	2.3
	Rural	1,802	775	1,027	2.3

Table C16: Alternative sources of power

		N	Have alternative source	Do not have alternative source
Total		702	67%	33%
Outlet	**Formal**	351	78%	22%
	Informal	351	56%	44%
State	**Lagos**	234	62%	38%
	Cross River	234	66%	34%
	Kano	234	73%	27%
Gender	**Male**	469	72%	28%
	Female	233	57%	43%
Urbanisation	**Urban**	162	73%	27%
	Peri-urban	324	69%	31%
	Rural	216	60%	40%

- Two-third of the traders have alternative sources of power; 78% in formal outlets, 73% each in Kano state and urban region.
- 40% traders in the rural region do not have alternative sources of power. This was also reported by 43% of the female traders and 44% of those who sell in the informal outlets.

Table C17: Alternative sources of power traders have

		N	Generator	Solar	Bio fuel	Others
	Total	472	93%	2%	1%	4%
Outlet	**Formal**	275	96%	3%	1%	4%
	Informal	197	89%	1%	1%	5%
State	**Lagos**	146	98%	1%	0%	0%
	Cross River	155	98%	0%	2%	0%
	Kano	171	85%	4%	0%	12%
Gender	**Male**	340	92%	2%	0%	5%
	Female	132	96%	0%	2%	2%
Urbanisation	**Urban**	119	84%	0%	1%	11%
	Peri-urban	223	96%	3%	0%	2%
	Rural	130	97%	1%	1%	2%

- Distinctly, generator (93%) is what most of the traders have as alternative source of power. Next to it with a very wide gap is solar (2%). 4% of the traders have reported other sources of alternative power. This was reported especially by the Kano traders; they refer to it as Independent energy providers locally called 'maja'. This is an arrangement where a group of traders get power source from a shared generator and pay the provider.

- Interestingly, peri-urban (96%) and rural (97%) use generator more as an alternative source of power than it is used in urban region (84%), perhaps because urban regions have received more supply of the national grid. 96% of the formal outlets reported using generator whereas 89% of the informal outlets reported same.

Table C18: Use and Expenses on Alternative Sources of Power

	Average Number of hours in a day that alternative power is used	Average Number of days in a week that alternative power is used	Cost of Fueling alternative power (monthly)	Cost of Maintaining alternative power (monthly)
GENERATOR				
N	440	438	417	394
Mean	6	6	6,183	1,378
S.D	2.8	1.5	6,419	1,646
SOLAR				
N	7	7		
Mean	8	6		
S.D	1.13	1.07		
BIO FUEL				
N	3	3		
Mean	4	4		
S.D	.58	1.73		

- Due to the availability gap in the required electricity, traders generally use generators for about 6 hours in a day; 6 days in a week; average cost of fueling is N6,183 and average monthly cost maintenance is N1,378.
- Solar was reported to be used 7 hours a day and 7 days a week.
- Biofuel was reported to be used for 3 hours a week and 3 days a week.
- The very few number of traders who reported their experience with solar and biofuel is worth noting.
- Traders could not specifically report on the maintenance costs for solar and no refuelling cost for biofuels.

Products Sold	Total Number of Traders that use Alternative Power	Number Traders that uses Solar
FMCG	118	3 (2.5%)
Fresh foods	15	1 (6.7%)
Electrical Appliance/Electronics	69	2 (2.9%)
Clothes/Shoes/Bags	99	3 (3.0%)

- 3 of the traders who sell FMCG goods, 1 fresh foods trader, 2 electrical appliances traders and 3 clothes/shoes/bags traders use solar power

Table C19: Are you pleased with your alternative source of power?

		N	Yes	No
Total		472	71%	29%
Outlet	**Formal**	275	75%	25%
	Informal	197	65%	35%
State	**Lagos**	146	66%	34%
	Cross River	155	63%	37%
	Kano	171	82%	18%
Gender	**Male**	340	73%	27%
	Female	132	64%	36%
Urbanisation	**Urban**	119	73%	27%
	Peri-urban	223	74%	26%
	Rural	130	64%	36%

- Less than one-third of the traders are not pleased with the alternative sources of power they have; 35% in informal outlets, 37% in Cross River state and 36% in rural region.

Alternative Power Used	Total Number of traders that have alternative source	Total Not Pleased
Generating set	440	135 (31%)
Solar	8	1 (13%)

- 31% of the traders who use generating sets are not pleased with it, while 1 out of the 8 traders who use solar is not pleased.

Table C20: Reason for not being pleased with current alternative power source

		N	Fuelling/Maintenance/Servicing cost is high	It is unaffordable	It is too noisy	It is unreliable/ Unstable	It does not give me what I want	Don't know/Can't really say
Outlet	**Total**	138	77%	1%	5%	4%	3%	11%
	Formal	70	83%	0%	4%	6%	0%	7%
	Informal	68	71%	1%	6%	1%	6%	15%
State	**Lagos**	50	78%	2%	6%	4%	2%	8%
	Cross River	58	76%	0%	7%	3%	2%	12%
	Kano	30	77%	0%	0%	3%	7%	13%
Gender	**Male**	91	77%	0%	1%	4%	3%	14%
	Female	47	77%	2%	13%	2%	2%	4%
Urbanisation	**Urban**	32	84%	0%	9%	0%	3%	3%
	Peri-urban	59	78%	2%	3%	3%	3%	10%
	Rural	47	70%	0%	4%	6%	2%	17%

- Many of the traders reported that fueling, maintenance and servicing cost are the reasons why they are not pleased with their alternative source of power. 13% of the females reported that their reason is because it is too noisy.

Table C21: Would you like to be connected to an/another alternative source of power?

		N	Yes	No
Total		702	57%	43%
Outlet	**Formal**	351	61%	39%
	Informal	351	53%	47%
State	**Lagos**	234	66%	34%
	Cross River	234	66%	34%
	Kano	234	39%	61%
Gender	**Male**	469	55%	45%
	Female	233	61%	39%
Urbanisation	**Urban**	162	48%	52%
	Peri-urban	324	60%	40%
	Rural	216	60%	40%

- More than half of the traders are willing to get connected to a new source or try an additional source of power.
- However, only 39% of the traders in Kano and 48% of the urban traders will like to be connected to a source or try another alternative source of power.

Willingness to Switch or Adopt Additional Source

State		C21. Would you like to be connected to an/another alternative source of power?		
	C19. Are you pleased with your alternative source of power?	Yes	No	Total
Lagos	Yes	68%	32%	100%
	No	68%	32%	100%
	Total	68%	32%	100%
Cross River	Yes	73%	27%	100%
	No	66%	35%	100%
	Total	70%	30%	100%
Kano	Yes	46%	54%	100%
	No	43%	57%	100%
	Total	46%	54%	100%

Base = 702

- Whether the traders are pleased with their current alternative source or not, they will like to be connected to an alternative source. This was reported by 68% of the traders in Lagos. A similar trend was observed in Cross River.
- The experience in Kano is slightly different, as 46% of the traders who are pleased with their current alternative source will like to be connected to another source.

New Adopters of Alternative Source of Power

State		C21. Would you like to be connected to an/another alternative source of power?		
		Yes	No	Total
	C16. Do you have alternative sources of power?			
Lagos	Yes	68%	32%	100%
	No	63%	38%	100%
	Total	66%	34%	100%
Cross River	Yes	70%	30%	100%
	No	58%	42%	100%
	Total	66%	34%	100%
Kano	Yes	46%	54%	100%
	No	21%	79%	100%
	Total	39%	61%	100%

Base = 702

- In Lagos, 63% traders who do not have any alternative source will like to be connected to an alternative source. Cross River; 58% and Kano; 21%.

Table C22: Reason traders do not want to be connected to alternative power source

		N	I don't think I need anything	I'm okay with the alternative (generator)/convenient	Expensive	Connected with friend	Don't know/Can't really say
Total		302	25%	47%	12%	0%	16%
Outlet	**Formal**	137	26%	45%	7%	0%	23%
	Informal	165	25%	48%	16%	1%	10%
State	**Lagos**	80	28%	39%	14%	0%	20%
	Cross River	79	29%	38%	14%	0%	19%
	Kano	143	22%	56%	10%	1%	11%
Gender	**Male**	212	25%	49%	12%	0%	14%
	Female	90	27%	41%	12%	0%	20%
Urbanisation	**Urban**	84	13%	63%	10%	0%	14%
	Peri-urban	131	28%	44%	17%	0%	11%
	Rural	87	33%	34%	7%	1%	24%

- 47% of the traders reported that they are okay with their current alternative source. One-third of those in the rural region reported that they do not think they need anything.

Table C23a: Type of alternative source of power traders would like to be connected to

			1st Choice			2nd Choice			3rd Choice		
			Generator	Solar	Inverter	Generator	Solar	Inverter	Generator	Inverter	Bio fuel
Total		400	20%	62%	1%	5%	14%	13%	3%	8%	7%
Outlet	**Formal**	214	21%	65%	1%	4%	15%	14%	2%	9%	7%
	Informal	186	18%	58%	0%	7%	12%	11%	3%	7%	7%
State	**Lagos**	154	23%	62%	1%	2%	14%	14%	1%	10%	12%
	Cross River	155	12%	68%	0%	10%	8%	18%	6%	5%	6%
	Kano	91	30%	53%	1%	3%	21%	1%	1%	11%	0%
Gender	**Male**	257	22%	61%	1%	6%	16%	11%	2%	10%	6%
	Female	143	16%	63%	0%	4%	10%	16%	3%	5%	8%
Urbanisation	**Urban**	78	8%	65%	1%	4%	4%	21%	1%	5%	6%
	Peri-urban	193	22%	65%	1%	6%	13%	11%	5%	7%	7%
	Rural	129	25%	55%	0%	5%	20%	11%	1%	12%	7%

- Many of the traders would like to be connected to solar as their first choice of alternative source of power. This was recorded more in formal outlets (65%), Cross River (68%), and among females (63%)
- While solar is still coming top as second choice, about 1 out of every 10 traders will still opt for inverter.
- About 8% of the traders will prefer inverter as third choice but this is closely followed by bio fuel (7%). Kano seems not to want bio fuel at all as 12% traders in Lagos embrace it as their third choice

Table C24: Cost of getting connected to Alternative Sources of Power

	Set up cost of getting connected to alternative source of power	Monthly running cost of getting connected to alternative source of power
GENERATOR		
N	84	109
Mean	31,941	2,858
S.D	60,763	2,805
SOLAR		
N	103	118
Mean	10,155	2,023
S.D	6,259	2,490
INVERTER		
N	19	20
Mean	14,789	1,605
S.D	14,478	2,418
BIO FUEL		
N	11	12
Mean	11,000	1,342
S.D	7,616	2,730

- As perceived by the traders, the average cost of getting connected to a generator is N31,941 and the monthly running cost is N2,858.
- The average cost of getting connected to solar power source is N10,155 and the monthly running cost is N2,023.
- The average cost of getting connected to an inverter is N14,789 and the monthly running cost is N1,605.
- The average cost of getting connected to biofuel is N11,000 and the monthly running cost is N1,342.

Table C25: Awareness about solar energy for generating electricity

		N	Yes	No
Total		702	41%	59%
Outlet	**Formal**	351	37%	63%
	Informal	351	46%	54%
State	**Lagos**	234	42%	58%
	Cross River	234	45%	55%
	Kano	234	37%	63%
Gender	**Male**	469	41%	59%
	Female	233	42%	58%
Urbanisation	**Urban**	162	52%	48%
	Peri-urban	324	36%	64%
	Rural	216	41%	59%

- 4 out of every 10 traders are aware of generating electricity from solar energy.
- Over half of the traders in urban region are more aware of solar energy than other regions.
- Surprisingly, more traders in informal outlet (46%) than in formal outlets (37%) are more aware of solar energy.

Table C26: Knowledge of where to purchase solar power

		N	Yes	No
Total		291	22%	78%
Outlet	**Formal**	131	26%	74%
	Informal	160	19%	81%
State	**Lagos**	99	14%	86%
	Cross River	106	26%	74%
	Kano	86	27%	73%
Gender	**Male**	193	23%	77%
	Female	98	20%	80%
Urbanisation	**Urban**	84	23%	77%
	Peri-urban	118	19%	81%
	Rural	89	26%	74%

- Knowledge of where to purchase solar power is quite low.
- Out of the traders that are aware of solar energy, only 22% of them know where to purchase it.
- Despite having less awareness among those in the formal outlets, they (26%) seem to have better knowledge of where to purchase it than the informal outlets (19%).

Table C27: Do you know how much solar power costs?

		C27. Do you know how much it costs?		
		N	Yes	No
Total		291	18%	82%
Outlet	**Formal**	131	15%	85%
	Informal	160	20%	80%
State	**Lagos**	99	11%	89%
	Cross River	106	18%	82%
	Kano	86	24%	76%
Gender	**Male**	193	21%	79%
	Female	98	11%	89%
Urbanisation	**Urban**	84	32%	68%
	Peri-urban	118	9%	91%
	Rural	89	15%	85%

- Only 18% of the traders know how much it costs to purchase solar energy. Of this 18%, 32% are in the urban region and 24% of them are in Kano.

C29: Do you know how solar power works ?

		N	Yes	No
Total		291	36%	64%
Outlet	**Formal**	131	36%	64%
	Informal	160	36%	64%
State	**Lagos**	99	40%	60%
	Cross River	106	33%	67%
	Kano	86	35%	65%
Gender	**Male**	193	37%	63%
	Female	98	34%	66%
Urbanisation	**Urban**	84	26%	74%
	Peri-urban	118	37%	63%
	Rural	89	44%	56%

- Almost two-third of the traders does not know how it works; 74% of them from urban region.

Table C30: Traders explaining how solar works

		N	It stores energy	Receives energy from the sun and turns in into electricity	Charges during the day and works at night	It is replaced on the roof	It does not use any form of fuel	Alternative sources of power	Don't know/Can't really say
Total		105	2%	79%	10%	2%	5%	2%	1%
Outlet	**Formal**	47	2%	83%	9%	2%	2%	2%	0%
	Informal	58	2%	76%	10%	2%	7%	2%	2%
State	**Lagos**	40	3%	80%	5%	0%	10%	3%	0%
	Cross River	35	3%	80%	9%	3%	3%	3%	0%
	Kano	30	0%	77%	17%	3%	0%	0%	3%
Gender	**Male**	72	3%	76%	11%	3%	4%	1%	1%
	Female	33	0%	85%	6%	0%	6%	3%	0%
Urbanisation	**Urban**	22	5%	82%	9%	0%	5%	0%	0%
	Peri-urban	44	0%	82%	5%	2%	7%	5%	0%
	Rural	39	3%	74%	15%	3%	3%	0%	3%

- Over 70% of the traders said solar power works by receiving energy from the sun and turning it into electricity. 10% of the trader reported that the way solar works is it charging during the day and working at night.

C31: In your opinion is Solar power a reliable source of power

		N	Yes	No
Total		291	33%	67%
Outlet	**Formal**	131	34%	66%
	Informal	160	33%	68%
State	**Lagos**	99	38%	62%
	Cross River	106	29%	71%
	Kano	86	33%	67%
Gender	**Male**	193	34%	66%
	Female	98	33%	67%
Urbanisation	**Urban**	84	23%	77%
	Peri-urban	118	33%	67%
	Rural	89	44%	56%

- Only about a one-third of the traders opined that solar power is a reliable source of power

C32: In your opinion is solar power easy to maintain?

		N	Yes	No
Total		291	27%	73%
Outlet	**Formal**	131	30%	70%
	Informal	160	25%	75%
State	**Lagos**	99	35%	65%
	Cross River	106	19%	81%
	Kano	86	28%	72%
Gender	**Male**	193	27%	73%
	Female	98	28%	72%
Urbanisation	**Urban**	84	17%	83%
	Peri-urban	118	29%	71%
	Rural	89	35%	65%

- Only about a quarter of the traders are of the opinion that solar is easy to maintain.
- While 35% of those in the rural region believe that solar is easy to maintain, only 17% of those in the urban region share in this opinion.

Table C33: Do you have access to a roof (or other open location) for a solar panel?

		N	Yes	No
Total		702	83%	17%
Outlet	**Formal**	351	87%	13%
	Informal	351	79%	21%
State	**Lagos**	234	88%	12%
	Cross River	234	83%	17%
	Kano	234	77%	23%
Gender	**Male**	469	82%	18%
	Female	233	85%	15%
Urbanisation	**Urban**	162	80%	20%
	Peri-urban	324	82%	18%
	Rural	216	86%	14%

- Many of the traders (83%) reported that they have access to a roof / another open space for solar panel.

C33a: Is this roof or another open space in a secure location?

		N	Yes	No
Total		581	80%	20%
Outlet	**Formal**	305	84%	16%
	Informal	276	76%	24%
State	**Lagos**	206	88%	12%
	Cross River	195	83%	17%
	Kano	180	69%	31%
Gender	**Male**	383	78%	22%
	Female	198	86%	14%
Urbanisation	**Urban**	129	84%	16%
	Peri-urban	267	82%	18%
	Rural	185	76%	24%

- Many of these traders reported that the roof / another open space is in a secure location.

Table C34. If a cost effective solar energy solution for providing power were available, with flexible payment structure would you be willing to use it as an alternative power source?

		N	Yes	No
Total		702	72%	28%
Outlet	**Formal**	351	79%	21%
	Informal	351	65%	35%
State	**Lagos**	234	83%	17%
	Cross River	234	81%	19%
	Kano	234	51%	49%
Gender	**Male**	469	68%	32%
	Female	233	79%	21%
Urbanisation	**Urban**	162	67%	33%
	Peri-urban	324	73%	27%
	Rural	216	73%	27%

- Over three-quarter (79%) of the traders in formal outlets are willing to use solar power as an alternative source of power.

Table C35: Reason for the willingness to use solar as an alternative power source.

		N	It is economical/okay for human health and environment	Lightening	Saves business/parts of a business	Cheaper, reliable, affordable, effective	Don't know/Can't really say
Total		504	4%	15%	12%	21%	48%
Outlet	**Formal**	276	4%	19%	12%	30%	34%
	Informal	228	4%	11%	11%	11%	64%
State	**Lagos**	195	3%	3%	15%	15%	64%
	Cross River	190	7%	7%	9%	21%	55%
	Kano	119	0%	49%	9%	33%	9%
Gender	**Male**	320	4%	20%	13%	25%	38%
	Female	184	4%	7%	9%	15%	64%
Urbanisation	**Urban**	108	5%	7%	6%	32%	49%
	Peri-urban	238	4%	21%	15%	15%	45%
	Rural	158	3%	12%	10%	23%	51%

- 21% of the traders reported that they will use solar power because it is cheaper, reliable, affordable, and effective. One-third of the traders affirmed this in Kano as well as a quarter of the male traders.

Table C36: Reason for not wanting solar as an alternative power source

		N	It might be costly/expensive/not affordable	I don't need it	No space	I dont know much about it/operates/maintenance	Until it is tested	Don't know/Can't really say
Total		198	8%	45%	12%	8%	5%	22%
Outlet	**Formal**	75	3%	48%	7%	8%	7%	28%
	Informal	123	11%	44%	15%	8%	4%	18%
State	**Lagos**	39	8%	21%	3%	18%	0%	51%
	Cross River	44	7%	14%	39%	0%	2%	39%
	Kano	115	8%	66%	5%	8%	8%	5%
Gender	**Male**	149	8%	56%	12%	5%	7%	13%
	Female	49	6%	14%	12%	18%	0%	49%
Urbanisation	**Urban**	54	2%	57%	13%	7%	0%	20%
	Peri-urban	86	10%	50%	10%	13%	10%	6%
	Rural	58	9%	28%	14%	2%	2%	47%

- 45% of the traders who do not want solar as an alternative power reported that they do not need it. About a two-third of the traders affirmed this in Kano.

Table E1 : Purposes Traders currently use energy for in their enterprise

		N	Lightning	Cooking	Key operation
Total		702	77	2	13
Outlet	**Formal**	351	82	1	13
	Informal	351	72	2	13
State	**Lagos**	234	83	2	12
	Cross River	234	72	30	12
	Kano	234	76	1	15
Gender	**Male**	469	78	3	13
	Female	233	75	2	14
Urbanisation	**Urban**	162	86	1	11
	Peri-urban	324	80		14
	Rural	216	66	2	13

- More than three-quarter of the trader use energy for lighting, whereas only 13% need light for their core operations.

Table D2: Equipments Traders use that require energy

	Equipment	(ii) Average number/ volume/units	(iii) Average hours used per day	(iv) Average Wattage /KVa	(v) Whether equipment uses AC or DC ?	
					AC (%)	DC (%)
A	Air conditioner	0.22	7.49	567.50	100%	
B	Lighting					
	1. Bulb	1.68	7.18	128.49	100%	
	2. Flourescent	0.44	7.62	106.36	98%	2%
	3. Halogen lamp	0.14	6.67	138.55	100%	
C	Refrigerator/Freezer	0.27	8.98	444.29	100%	
D	Radio	0.33	7.45	233.55	77%	23%
E	Television	0.24	6.93	263.71	100%	
F	Fan	0.86	7.77	200.35	100%	
G	Business equipment using power:					
	1.Dryer	0.00	3.33	200.00	100%	
	2.Clipper	0.01	11.00	220.00	100%	
	3. Sewing machines	0.02	8.83	300.00	100%	
H	Mobile phone charging	0.79	4.18	194.66		100%
I	Kitchen equipment using power:					
	1.Microwave	0.01	3.57	220.00	100%	
	2. Hotplate	0.00	5.00	60.00	100%	

Table D3: The minimum amount of energy/ the MINIMUM number and types of equipment Traders need to keep your business running

	(i) Equipment	(ii) Average number/ volume/units	(iii) Average hours used per day	(iv) Wattage /KVa	(v) Whether equipment uses AC or DC	
					AC%	DC%
A	Air conditioner	1.55	8.00	-	100%	
B	Lighting					
	1. Bulb	1.29	7.03	83.41	100%	
	2. Flourescent	1.12	6.61	69.17	100%	
	3. Halogen lamps	1.00	5.50	200.00	100%	
C	Refrigerator/Freezer	1.07	7.05	120.00	99%	1%
D	Radio	1.00	6.32	45.00	94%	6%
E	Television	1.00	5.33	120.00	99%	1%
F	Fan	1.06	7.13	151.88	100%	
G	Business equipment using power:					
	1.Dryer	1.00	-	-	100%	
	2.Clipper	3.50	10.00	220	100%	
	3. Sewing machines	1.00	7.00	120.00	100%	
H	Mobile phone charging	1.01	6.84	52.86		100%
I	Kitchen equipment using power:					
	1.Microwave	1.00	-	-		
	2. Hotplate	1.00	-	-		

Section E: Energy Expenditure

Table E1 : Amount spent on Energy in the previous month

			Electricity	Diesel	Petrol	Kerosene	Firewood	Coal	Batteries
Total		N	554	46	424	85	28	35	30
		Mean	1,570	6,980	6,429	1,521	1,723	2,680	470
		S.D	1,733	16,521	6,504	1,649	1,953	3,625	388
Outlet	Formal	N	288	22	237	30	7	13	6
		Mean	1,782	12,841	6,940	1,809	2,543	3,492	585
		S.D	1,853	22,521	6,579	2,181	2,830	4,655	707
	Informal	N	266	24	187	55	21	22	24
		Mean	1,341	1,607	5,781	1,364	1,450	2,200	442
		S.D	1,563	2,819	6,367	1,266	1,561	2,871	278
States	Lagos	N	201	26	140	33	5	22	8
		Mean	1,920	3,804	4,939	1,565	1,340	3,832	556
		S.D	2,126	11,779	3,927	1,895	654	4,168	650
	Cross River	N	178	3	135	43	16	11	11
		Mean	1,638	10,650	8,022	1,533	1,297	727	583
		S.D	1,825	17,625	8,227	1,561	1,335	566	247
	Kano	N	175	17	149	9	7	2	11
		Mean	1,100	11,188	6,385	1,300	2,971	750	295
		S.D	770	21,779	6,381	1,149	3,163	354	165
Gender	Male	N	366	33	301	31	10	6	24
		Mean	1,564	7,390	6,596	1,418	1,770	550	484
		S.D	1,748	16,799	6,744	1,461	2,642	383	410
	Female	N	188	13	123	54	18	29	6
		Mean	1,584	5,938	6,021	1,580	1,697	3,121	417
		S.D	1,708	16,413	5,883	1,758	1,537	3,841	311
Urbanisation	Urban	N	124	8	92	16	3	7	10
		Mean	1,746	1,688	10,243	1,881	2,000	3,486	436
		S.D	1,565	1,407	8,645	1,169	2,179	3,650	252
	Peri-urban	N	269	26	205	46	14	19	13
		Mean	1,443	10,115	5,382	1,395	2,004	2,758	523
		S.D	1,815	21,435	5,201	1,906	2,271	4,234	537
	Rural	N	161	12	127	23	11	9	7
		Mean	1,647	3,714	5,355	1,523	1,291	1,889	421
		S.D	1,709	3,987	5,539	1,374	1,519	2,055	216

- In the previous month, energy expenditure was highest on diesel; N 6,980 followed by petrol; N 6,429, Coal; N 2,680, firewood; N 1,723, electricity; N 1,570, kerosene; N1,521 and batteries; N470.
- Formal outlets spent 8 times more on diesel (N12,841) than informal outlets (N 1,607).
- Lagos traders spent more on electricity (N1,920), than Cross River (N 1,638) and Kano (N 1,100). Consequently, they (Lagos traders) spend lesser on petrol (N4,939) than Cross River (N8,022) and Kano (N6,385). A similar trend was observed for diesel.
- Outlets in urban areas (N 10,243) spent twice as much as outlets in the rural (N 5,355) or peri-urban (N 5,382) on petrol.

Table E2 : Percentage of Total Business Cost currently spent on Power, monthly

			Percentage of Total Business Cost currently spent on Power, monthly			
		N	Mean %	S.D	Minimum	Maximum
Total		555	11	10	1	60
Outlet	**Formal**	300	11	11	1	60
	Informal	255	11	10	1	60
State	**Lagos**	192	9	9	1	60
	Cross River	151	11	9	1	45
	Kano	212	13	11	1	60
Gender	**Male**	373	12	11	1	60
	Female	182	9	8	1	40
Urbanisation	**Urbanisation**	135	11	9	1	60
	Peri-urban	266	11	10	1	60
	Rural	154	12	12	1	60

- The amount traders spend monthly on power accounts to 11% of their total business cost. While this observation holds true irrespective of the type of outlets, Lagos traders reported 9% while Kano traders reported 13%. The male traders also reported as high as 12%, likewise traders in the rural areas.

Table E3: How Energy Expenditures are financed

		How Energy Expenditures are financed				
		N	My business cash flow	Loan	Family	Friends
Total		702	97%	1%	1%	1%
Outlet	**Formal**	351	99%	0%	0%	1%
	Informal	351	95%	3%	1%	1%
State	**Lagos**	234	97%	2%	1%	0%
	Cross River	234	94%	3%	1%	3%
	Kano	234	100%	0%	0%	0%
Gender	**Male**	469	98%	1%	1%	1%
	Female	233	95%	3%	1%	1%
Urbanisation	**Urban**	162	94%	3%	1%	2%
	Peri-urban	324	97%	1%	1%	0%
	Rural	216	99%	0%	0%	1%

- Nearly all the traders (97%) finance their energy expenditure from their business cash flow. All the traders in Kano out rightly reported this.

Table E3: How Energy Expenditures are financed

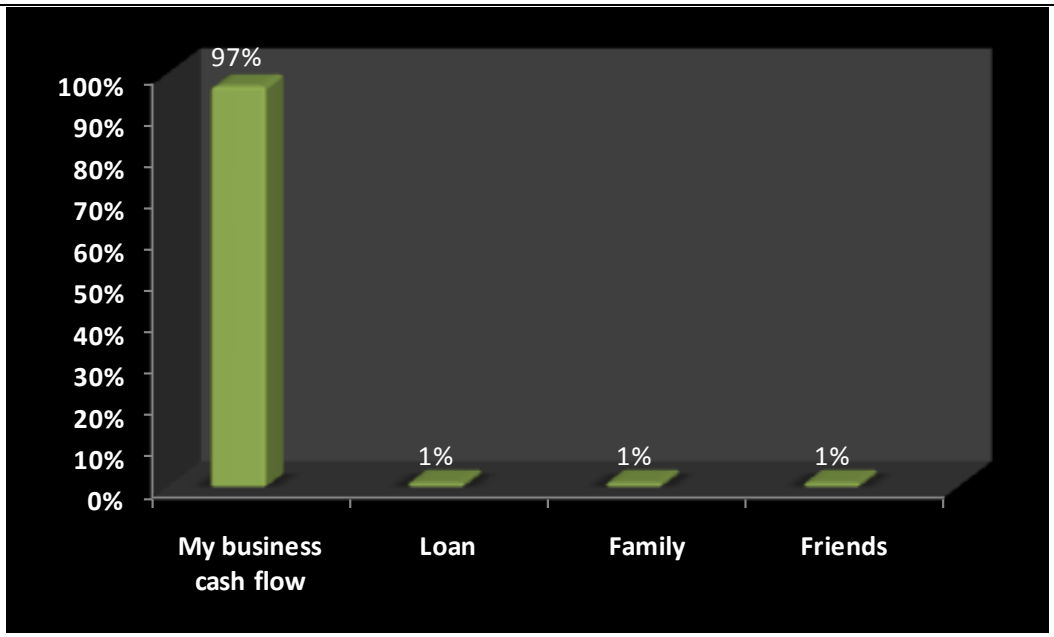
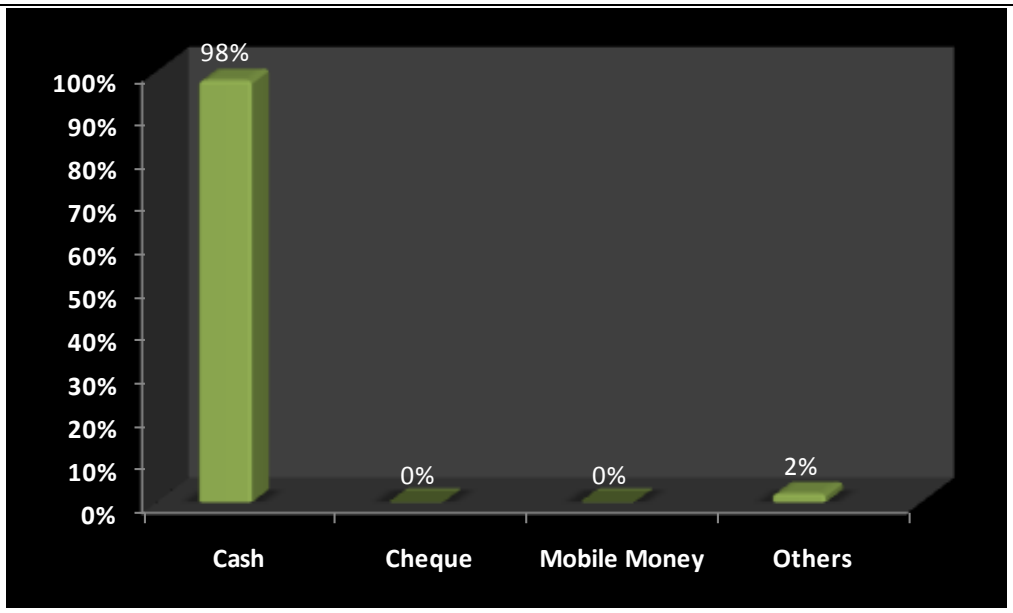


Table E4: How payment for energy expenditure is made

		N	Cash	Cheque	Mobile Money	Others
Total		702	98%	0%	0%	2%
Outlet	**Formal**	351	99%	0%	0%	1%
	Informal	351	97%	0%	0%	2%
State	**Lagos**	234	97%	0%	0%	2%
	Cross River	234	98%	0%	0%	2%
	Kano	234	99%	0%	0%	1%
Gender	**Male**	469	98%	0%	0%	2%
	Female	233	98%	0%	0%	2%
Urbanisation	**Urban**	162	98%	0%	0%	2%
	Peri-urban	324	99%	0%	0%	1%
	Rural	216	97%	0%	0%	3%

- Cash payment is the major payment method reported by nearly all the traders.

Table E4: How payment for energy expenditure is made



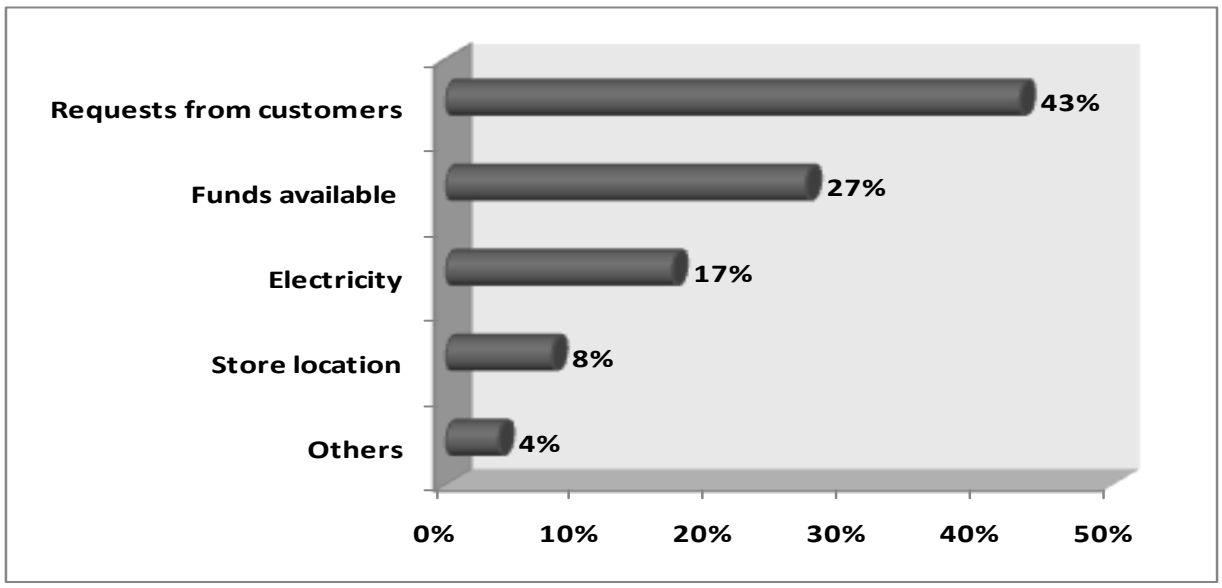
Section F: Use of Additional Electricity If it was Available

Table F1: Factors that determines the range of products or services offered

		N	Electricity	Requests from customers	Funds available	Store location	Others
Total		702	17%	43%	27%	8%	4%
Outlet	**Formal**	351	21%	37%	24%	12%	5%
	Informal	351	13%	49%	30%	4%	3%
State	**Lagos**	234	8%	48%	30%	4%	10%
	Cross River	234	11%	36%	34%	19%	0%
	Kano	234	33%	45%	17%	2%	2%
Gender	**Male**	469	22%	43%	25%	7%	3%
	Female	233	9%	44%	31%	10%	6%
Urbanisation	**Urban**	162	8%	48%	32%	10%	2%
	Peri-urban	324	22%	40%	25%	8%	5%
	Rural	216	18%	45%	26%	7%	4%

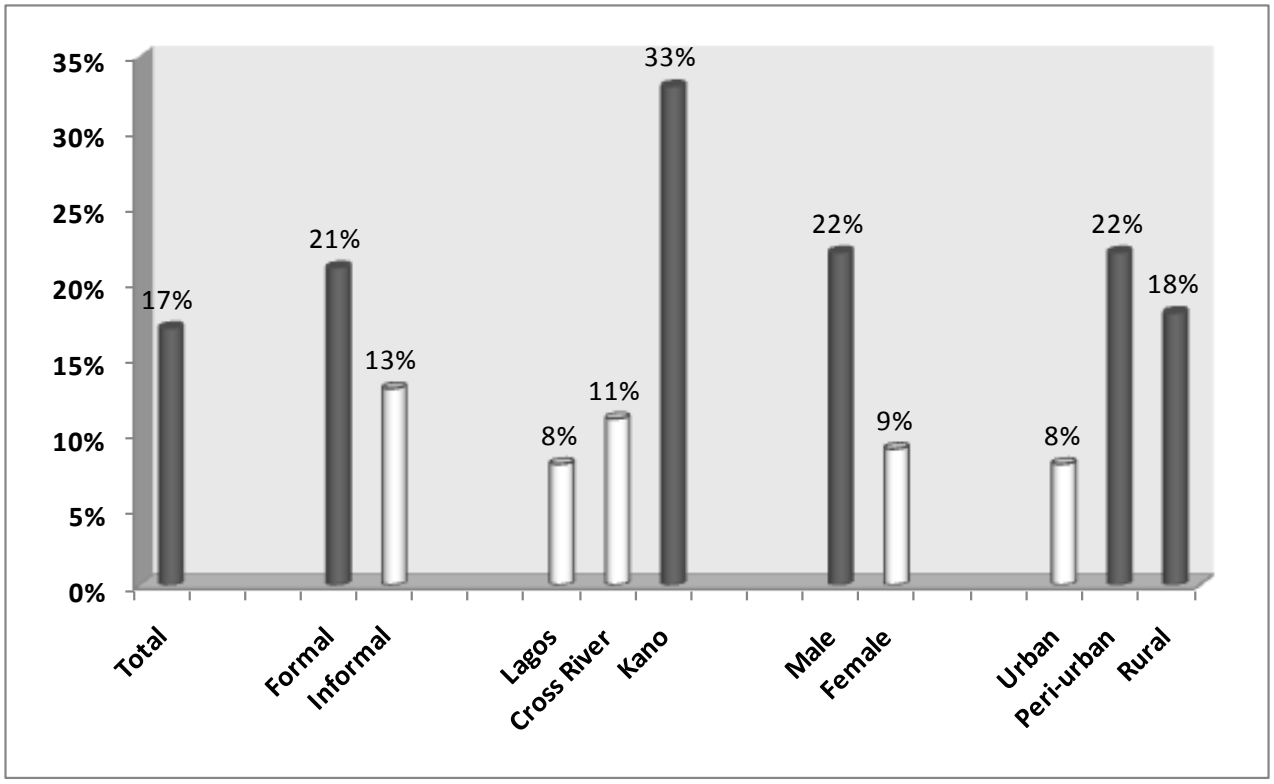
- 'Requests from customers' (43%) was mostly reported as the factor that determines the range of product or service offered.

Fig F1.1: Factors that determines the range of products or services offered



- Funds available (27%) follows request from customers on the list of factors determining the range of products or services traders offer. Electricity comes third (17%).

Fig F1.1: How Electricity affects the range of products or services offered



- The formal outlets (21%) are more affected by electricity than informal outlets (13%); Kano traders (33%) more than Cross River (11%) and Lagos traders (8%).
- The urban traders (8%) do not feel electricity affects the range of products or services they render like the peri-urban (22%) and rural traders (18%).
- The males (22%) are of the opinion that electricity affects the range of products or services they render than the female (9%).

Table F2: How availability of power/electricity would change business

		N	It will not change the business	Business will run smoothly/ effectivel	Variety of products/ services will be sold/offered	Services will be improved	It will reduce expenses	Not sure	There will be more sales/customers	Trading hours will increase
Total		457	13%	25%	4%	14%	3%	3%	32%	5%
Outlet	**Formal**	224	9%	28%	3%	17%	4%	3%	32%	5%
	Informal	233	18%	22%	5%	12%	3%	3%	32%	6%
State	**Lagos**	159	9%	31%	2%	19%	6%	3%	26%	4%
	Cross River	156	13%	15%	4%	10%	1%	0%	48%	9%
	Kano	142	18%	28%	7%	14%	4%	5%	20%	4%
Gender	**Male**	305	15%	26%	4%	13%	3%	3%	30%	6%
	Female	152	10%	24%	4%	18%	3%	2%	34%	5%
Urbanisation	**Urban**	114	13%	33%	5%	11%	3%	4%	27%	4%
	Peri-urban	211	11%	18%	4%	16%	4%	3%	36%	7%
	Rural	132	17%	28%	3%	15%	3%	2%	28%	5%

- About 25% of the traders reported that if power/electricity were available all the time business will run smoothly/effectively while about one-third reported that there will be more customers and more sales.

Table F3: If Electricity were available all the time, would it change the type of business you do (products that you sell/ services rendered)?

		N	Yes	No
Total		702	15%	85%
Outlet	**Formal**	351	13%	87%
	Informal	351	17%	83%
State	**Lagos**	234	15%	85%
	Cross River	234	11%	89%
	Kano	234	18%	82%
Gender	**Male**	469	12%	88%
	Female	233	20%	80%
Urbanisation	**Urban**	162	12%	88%
	Peri-urban	324	16%	84%
	Rural	216	15%	85%

- Only 15% of the retailers reported that availability of electricity all the time will bring a change to the type of business they do. 2 out of every 10 female traders reported this.

Table F4: The products that traders will sell/ services that can be rendered if electricity were available all the time

		N	Drinks/ Cold room/Iced block	FMCG products	Electronics	Fresh/Other foods	Charging of phones and accessories	Clothes and accessories	Selling price will be reduced	Business will be expanded	Varieties
Total		84	49	5	6	3	4	4	1	1	7
Outlet	**Formal**	33	16	3	3	1	2	1	1	0	5
	Informal	51	33	2	3	2	2	3	0	1	2
State	**Lagos**	27	17	2	1	0	1	1	0	0	3
	Cross River	22	11	2	1	2	1	3	0	1	0
	Kano	35	21	1	4	1	2	0	1	0	4
Gender	**Male**	44	21	5	5	1	3	0	1	1	5
	Female	40	28	0	1	2	1	4	0	0	2
Urbanisation	**Urban**	12	6	1	2	1	1	1	0	0	0
	Peri-urban	43	25	2	4	2	3	2	0	0	2
	Rural	29	18	2	0	0	0	1	1	1	5

- Out of 84 traders who specified the products they will sell, 49 of them specified drinks/icedblock as products they will sell. This was reported more by those in informal outlets (33), females (28) as well as those in the peri-urban region (25).

Table F5: Would availability of electricity all the time change the trading hours you do business?

		N	Yes	No
Total		702	31%	69%
Outlet	**Formal**	351	24%	76%
	Informal	351	38%	62%
State	**Lagos**	234	26%	74%
	Cross River	234	32%	68%
	Kano	234	34%	66%
Gender	**Male**	469	30%	70%
	Female	233	33%	67%
Urbanisation	**Urban**	162	30%	70%
	Peri-urban	324	30%	70%
	Rural	216	34%	66%

- 3 out of every 10 retailers reported that availability of electricity all the time will bring a change to their trading hours.

Table F3: If Electricity were available all the time, would it change the type of business you do (products that you sell/ services rendered)?

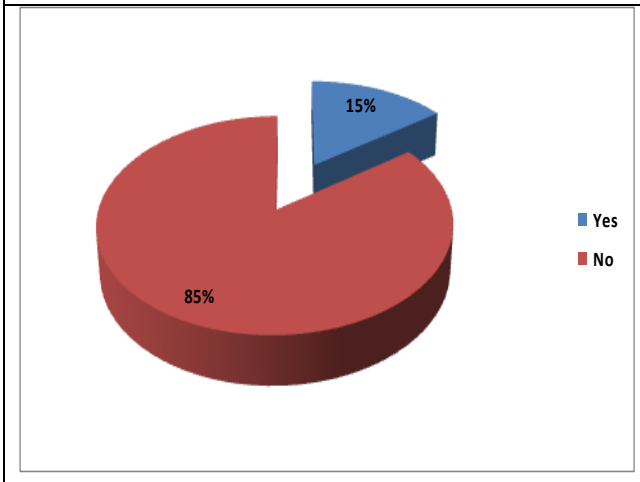
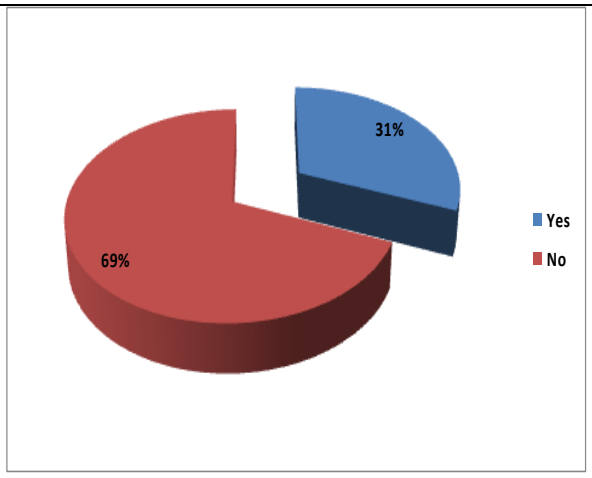


Table F5: Would availability of electricity all the time change the trading hours you do business?



- While nearly 2 out of 10 traders feel availability of electricity will change the type of business they do, 3 out of 10 feel it will change the trading hours they do business.

Table F6: How Availability of Electricity will change trading hours

		N	Increase it/extend trading hours	Decrease/shorten trading hours	No change to trading hours
Total		217	85%	3%	12%
Outlet	**Formal**	85	84%	5%	12%
	Informal	132	86%	2%	11%
State	**Lagos**	62	94%	3%	3%
	Cross River	75	79%	5%	16%
	Kano	80	85%	1%	14%
Gender	**Male**		84%	4%	13%
	Female	77	88%	3%	9%
Urbanisation	**Urban**	48	73%	4%	23%
	Peri-urban	96	88%	2%	10%
	Rural	73	90%	4%	5%

- Extension of trading hours was reported as the change availability of electricity will bring by 8 out of every 10 traders who reported that availability of electricity will bring a change.

Table F7: Number of hours by which availability of electricity will increase retailers' trading hours

		N	1 to under 2 hours	Increase by 2 - 4	Increase by over 4 hours
Total		185	65%	24%	11%
Outlet	**Formal**	71	66%	21%	13%
	Informal	114	64%	25%	11%
State	**Lagos**	58	72%	28%	0%
	Cross River	59	53%	12%	36%
	Kano	68	69%	31%	0%
Gender	**Male**	117	59%	27%	14%
	Female	68	75%	18%	7%
Urbanisation	**Urban**	35	80%	14%	6%
	Peri-urban	84	56%	30%	14%
	Rural	66	68%	21%	11%

- On the average about 65% of the traders will spend 1 – under 2 trading hours more if electricity were available. 72% of the traders In Lagos and 75% of the female traders will spend 1 – under 2 trading hours more if electricity were available.

Fig. F6: How Availability of Electricity will change trading hours

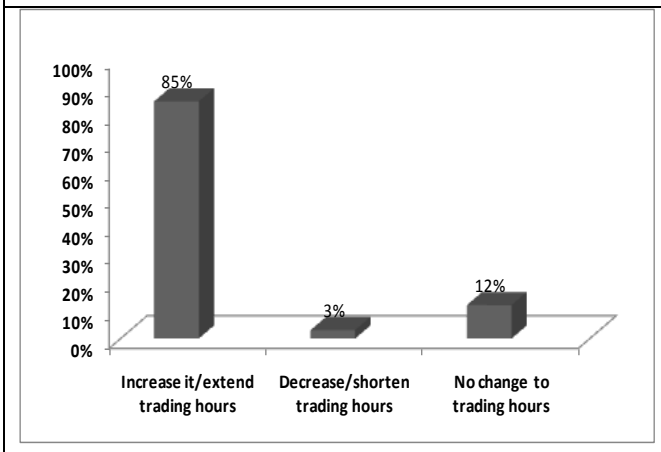
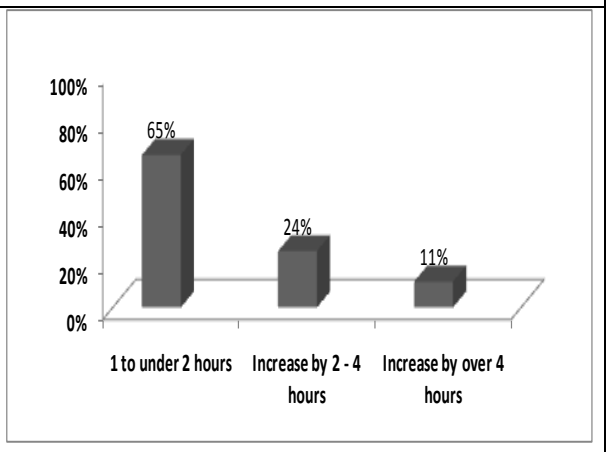


Fig. F7: Number of hours by which availability of electricity will increase retailers' trading hours



- Among the traders who reported that availability of electricity will change their trading hours, nearly 9 out 10 reported it will increase the trading hours. Among those who reported it will increase the trading hours, nearly 7 out of 10 reported it will increase it by 1 to under 2 hours.

Table F9: Would availability of electricity have a positive impact on your sales or the quality of service you provide within your current trading hours?

		N	Yes	No
Total		515	43%	57%
Outlet	**Formal**	280	45%	55%
	Informal	235	40%	60%
State	**Lagos**	176	51%	49%
	Cross River	175	37%	63%
	Kano	164	40%	60%
Gender	**Male**	350	42%	58%
	Female	165	44%	56%
Urbanisation	**Urban**	127	52%	48%
	Peri-urban	240	43%	57%
	Rural	148	34%	66%

- While over 50% of the traders in urban region and in Lagos reported that availability of electricity will have a positive impact on their sales or the quality of service they provide within their current trading hours, only 37 % in Cross River reported this positive impact.

Table F11: Would you be willing to pay to have additional hours of reliable power/ electricity ?

		N	Yes	No
Total		698	44%	56%
Outlet	**Formal**	348	43%	57%
	Informal	350	45%	55%
State	**Lagos**	234	43%	57%
	Cross River	234	46%	54%
	Kano	230	43%	57%
Gender	**Male**	466	43%	57%
	Female	232	46%	54%
Urbanisation	**Urban**	159	47%	53%
	Peri-urban	324	43%	57%
	Rural	215	43%	57%

- Less than half (44%) of the traders will be willing to pay for additional hours of reliable power/ electricity.
- Generally, 4 out of every 10 traders are willing to pay for additional hours, irrespective of the type of outlet, state, gender or urbanization.

Table F8: Additional revenue that could be generated Daily by Trading longer hours.

Table F10: Additional revenue that could be generated Daily from the positive impact on sales or quality of service provided as a result of constant electricity within current trading hours.

		F8. **Additional revenue that could be generated by Trading longer hours**			**F10. Additional revenue that could be generated from the positive impact on sales or quality of service provided as a result of constant electricity within current trading hours**		
		N	**Mean**	**S.D**	**N**	**Mean**	**S.D**
Total		152	3,242	4,794	178	4,702	6,769
Outlet	**Formal**	54	4,694	7,441	102	5,794	8,107
	Informal	98	2,442	1,923	76	3,236	3,978
State	**Lagos**	49	2,947	3,131	77	6,077	8,895
	Cross River	58	2,742	2,143	55	4,036	4,514
	Kano	45	4,207	7,800	46	3,196	4,007
Gender	**Male**	92	3,416	5,660	118	4,826	6,297
	Female	60	2,974	3,047	60	4,458	7,663
Urbanisation	**Urbanisation**	31	5,729	9,127	57	7,679	9,225
	Peri-urban	69	2,930	3,030	79	3,439	5,025
	Rural	52	2,173	1,321	42	3,037	3,912

- On the average, the traders reported they could generate N 3,242 daily, by trading longer hours. Kano reported more than this general mean (N4,207) whereas, Lagos (N 2,947) and Cross River (N 2,742) reported lower than the mean average. The formal outlets will make nearly double (N 4,694) additional revenue compared with the informal outlets (N 2,442) by trading longer hours.

- The daily additional revenue that could be generated from positive impact on sales or quality of service provided as a result of constant electricity within the trading hours was estimated as N 4,704. Formal outlets; N5,794, Lagos traders; N6,077, male traders; N4,826 and urban outlets; N7,679.

Table F12: Amount Traders can afford to pay Monthly (based on earnings from the business) for an alternative power source, if it will guarantee reliable power for an extra 4 hours per day

Table F13: Amount Traders would pay Monthly for an alternative power source, if it will guarantee reliable power for an extra 4 hours per day

		F12. Amount Traders can afford to pay for an alternative power source for an extra 4 hours per day			F13. Amount Traders would pay for an alternative power source for an extra 4 hours per day		
		N	Mean	S.D	N	Mean	S.D
Total		280	828	1,875	268	621	1,000
Outlet	**Formal**	140	950	2,298	135	698	1,062
	Informal	140	705	1,320	133	542	932
State	**Lagos**	98	846	1,118	96	719	1,113
	Cross River	96	1,186	2,883	93	716	1,054
	Kano	86	407	703	79	388	729
Gender	**Male**	181	930	2,226	171	643	1,002
	Female	99	641	922	97	581	1,001
Urbanisation	**Urbanisation**	71	702	662	68	602	645
	Peri-urban	128	966	2,468	124	767	1,321
	Rural	81	720	1,466	76	398	492

- While traders can afford to pay N828 for alternative power source if it will guarantee reliable power for an extra 4 hours per day, they are only willing to pay N621.
- While traders in Cross River are able to pay highest, (N1,186), Lagos traders (N 719) are willing to pay slightly higher than them (N 716).

Table F14 : Amount Traders can afford to pay (based on earnings from the business) for an alternative power source, if it will guarantee reliable power for the whole day

Table F15: Amount would pay for an alternative power source, if it will guarantee reliable power for the whole day

		F14. Amount Traders can afford to pay for an alternative power source for the whole day			F15. Amount Traders would pay for an alternative power source for the whole day		
		Total	Mean	S.D	Total	Mean	S.D
Total		278	732	1,241	267	553	623
Outlet	**Formal**	138	854	1,213	132	732	792
	Informal	140	613	1,261	135	377	307
State	**Lagos**	98	1,037	1,656	94	753	846
	Cross River	98	622	654	97	487	388
	Kano	82	500	1,137	76	388	459
Gender	**Male**	177	791	1,431	167	572	627
	Female	101	630	805	100	521	618
Urbanisation	**Urbanisation**	68	763	687	62	688	718
	Peri-urban	128	920	1,707	126	602	691
	Rural	82	414	393	79	368	319

- If alternative source would guarantee reliable power for the whole day, traders are willing to pay an average of N553, although they can afford as much as an average of N732.

Table F16: Payment for Main Grid Electricity

			How do you currently pay		how would you prefer to pay		Preferable method for payment	
			Upfront/bulk payment	Installmentally	Upfront/bulk payment	Installmentally	Cash at providers' office or payment location	POS at providers' office or payment location
Total		296	9%	82%	9%	84%	82%	2%
Outlet	**Formal**	146	11%	83%	9%	86%	82%	1%
	Informal	150	8%	81%	10%	82%	82%	3%
State	**Lagos**	101	2%	95%	2%	95%	95%	2%
	Cross River	107	10%	73%	7%	81%	58%	4%
	Kano	88	17%	78%	20%	75%	95%	0%
Gender	**Male**	190	11%	84%	12%	84%	85%	3%
	Female	106	7%	79%	5%	85%	75%	1%
Urbanisation	**Urban**	68	6%	90%	16%	79%	87%	0%
	Peri-urban	140	10%	80%	7%	86%	80%	0%
	Rural	88	11%	80%	8%	84%	81%	7%

- Many of the traders especially in Lagos (95%) pay for main grid electricity instalmentally (including daily/prepaid, monthly, pay as you use) and they will like to continue with this trend. They will prefer to pay cash at providers' office or payment location.

Table F16: Payment for Electricity from Generator

		How do you currently pay ?		How would you prefer to pay?	
	Total	Upfront/bulk payment	Installmentally	Upfront/bulk payment	Installmentally
Total	227	21%	74%	19%	75%
Formal	125	22%	74%	21%	75%
Informal	102	20%	75%	18%	75%
Lagos	71	21%	77%	20%	76%
Cross River	83	4%	90%	2%	92%
Kano	73	41%	53%	38%	55%
Male	157	22%	75%	20%	76%
Female	70	20%	74%	19%	73%
Urban	53	23%	77%	23%	77%
Peri-urban	111	17%	75%	14%	77%
Rural	63	27%	71%	25%	70%

- About three-quarter of the traders pay currently for electricity from generator instalmentally (including daily/prepaid, monthly, pay as you use) and they will like to continue with this trend. This was recorded more in Cross River (90% and 92% respectively).

Section G: Access to Financial Services

Table G1: Access to Mobile Phones

		N	Have access	No access
Total		702	97%	3%
Outlet	**Formal**	351	96%	4%
	Informal	351	97%	3%
State	**Lagos**	234	99%	1%
	Cross River	234	96%	4%
	Kano	234	95%	5%
Gender	**Male**	469	97%	3%
	Female	233	95%	5%
Urbanisation	**Urban**	162	99%	1%
	Peri-urban	324	96%	4%
	Rural	216	95%	5%

- Nearly all traders have access to mobile phones.

G2: Access to mobile money services

		N	Have access	No access
Total		702	15%	85%
Outlet	**Formal**	349	18%	82%
	Informal	351	12%	88%
State	**Lagos**	234	28%	72%
	Cross River	234	15%	85%
	Kano	232	2%	98%
Gender	**Male**	467	13%	87%
	Female	233	18%	82%
Urbanisation	**Urban**	160	18%	82%
	Peri-urban	324	14%	86%
	Rural	216	14%	86%

- Only 15% of the traders have access to mobile money services. More than a quarter of the traders in Lagos have access to mobile money. Surprisingly, only 2% of the traders in Kano reported access to mobile money services.

Table G3: Use of mobile money services

		N	Use mobile money	Do not use mobile money
Total		104	26%	74%
Outlet	**Formal**	62	35%	65%
	Informal	42	12%	88%
State	**Lagos**	65	20%	80%
	Cross River	34	38%	62%
	Kano	5	20%	80%
Gender	**Male**	63	29%	71%
	Female	41	22%	78%
Urbanisation	**Urban**	29	41%	59%
	Peri-urban	45	22%	78%
	Rural	30	17%	83%

- Among the traders who have access to mobile money service, only about a quarter use it.

Fig G2: Access to mobile money services

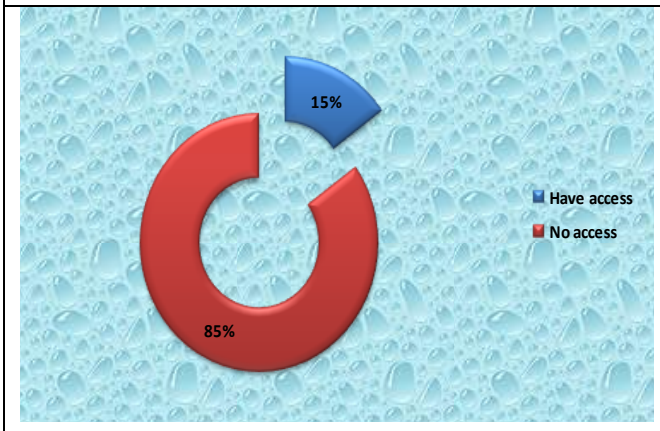


Fig G3: Use of mobile money services

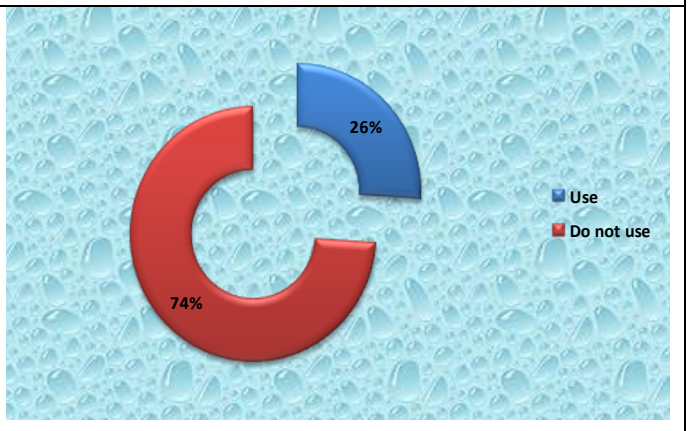


Fig. G3: Use of mobile money services

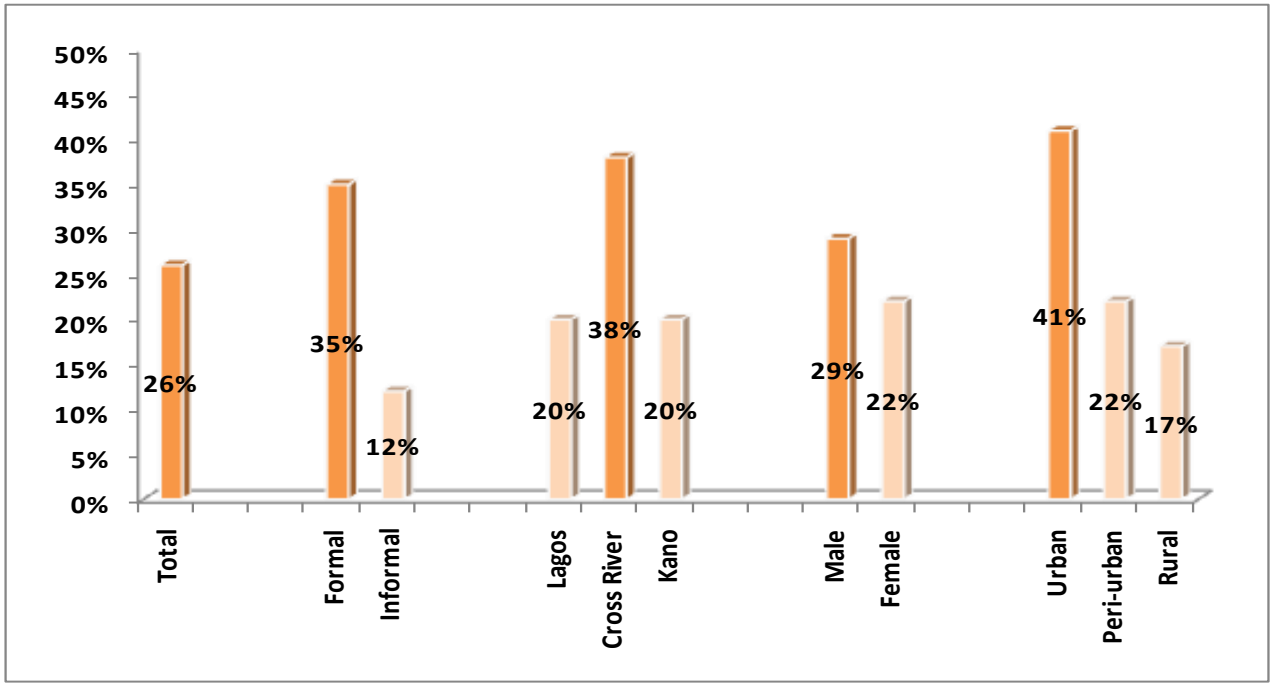


Table G5: Have you borrowed any money from a micro-finance organization?

		N	Yes	No
Total		702	12%	88%
Outlet	**Formal**	350	13%	87%
	Informal	351	12%	88%
State	**Lagos**	234	17%	83%
	Cross River	234	15%	85%
	Kano	233	4%	96%
Gender	**Male**	468	10%	90%
	Female	233	16%	84%
Urbanisation	**Urban**	161	12%	88%
	Peri-urban	324	11%	89%
	Rural	216	14%	86%

- Only one out of every 10 traders has borrowed money from a micro-finance organization irrespective of the outlet, location and gender. Kano recorded least in this regard; 4%.

G6: If no, Reason for traders not borrowing any money from a micro-finance organization

		N	They are not trusted	The interest rate is high	I don't need it / like it	No access/i do not know how it works	My capital is enough for me	It is tedious to get	I do not want to be indebted/it is not good	I borrow from friends and family
Total		495	0%	5%	68%	11%	1%	4%	9%	1%
Outlet	**Formal**	225	0%	4%	69%	10%	1%	6%	8%	2%
	Informal	270	1%	6%	67%	11%	1%	3%	10%	0%
State	**Lagos**	120	0%	11%	75%	6%	3%	1%	5%	0%
	Cross River	172	0%	3%	65%	14%	0%	1%	15%	2%
	Kano	203	1%	2%	67%	11%	1%	10%	6%	0%
Gender	**Male**	343	1%	4%	68%	12%	1%	6%	7%	1%
	Female	152	0%	6%	68%	8%	1%	2%	13%	1%
Urbanisation	**Urban**	110	0%	5%	75%	7%	0%	6%	6%	0%
	Peri-urban	230	0%	4%	68%	8%	2%	4%	11%	2%
	Rural	155	1%	5%	63%	17%	1%	4%	8%	1%

- More than 60% of the traders who did not borrow any money from a micro finance organization did not do so because they do not need it/like it. This is also the reason recorded for three-quarter of the traders in the urban region as well as in Lagos state.

Table G7: Ownership of bank account

		N	Have bank account	Do not have bank account
Total		701	70%	30%
Outlet	**Formal**	350	77%	23%
	Informal	351	63%	37%
State	**Lagos**	234	88%	12%
	Cross River	234	72%	28%
	Kano	233	51%	49%
Gender	**Male**	468	68%	32%
	Female	233	76%	24%
Urbanisation	**Urban**	161	90%	10%
	Peri-urban	324	69%	31%
	Rural	216	59%	41%

- Many of the traders (70%) have a bank account.
- Among the states, Lagos traders (88%) reported highest ownership of bank account, while Kano recorded least (52%).
- 6 out of 10 traders in the rural areas have bank accounts, compared to the urban traders; 9 out of 10.

G8: Access to credit facilities from your bank (among traders who have bank accounts)

		N	Have access	No access	Don't know/can't really say
Total		494	22%	77%	1%
Outlet	**Formal**	272	27%	72%	1%
	Informal	222	16%	82%	1%
State	**Lagos**	206	27%	72%	1%
	Cross River	168	29%	70%	1%
	Kano	120	3%	95%	2%
Gender	**Male**	318	22%	77%	1%
	Female	176	23%	76%	2%
Urbanisation	**Urban**	145	26%	74%	1%
	Peri-urban	222	23%	76%	1%
	Rural	127	17%	81%	2%

- Among the traders who have bank accounts, 22% reported having access to credit facilities from their banks.
- More formal traders (27%) have access to credit facilities from their banks than informal traders (16%).
- Very low access to credit facilities (from bank) was recorded in Kano state; 3%, this figure is even lower than that recorded in the rural areas on the general (17%).

Table G9: Access to any other financial services (i.e. insurance, savings, etc)

		N	Have access	No access
Total		702	28%	72%
Outlet	**Formal**	349	28%	72%
	Informal	351	28%	72%
State	**Lagos**	234	33%	67%
	Cross River	234	46%	54%
	Kano	232	5%	95%
Gender	**Male**	467	23%	77%
	Female	233	36%	64%
Urbanisation	**Urban**	160	28%	72%
	Peri-urban	324	29%	71%
	Rural	216	25%	75%

- Nearly 3 out of 10 traders have access to other financial services.
- While 4 out of every 10 traders in Cross River have access to other financial services, only 1 out every 10 traders in Kano has such access.

Section H: Communication Channels

Table H1a: Main source of information for Traders

		N	Television	Radio	Mobile phones	Newspaper/other print media	Friends and family
Total		702	25%	42%	25%	6%	3%
Outlet	**Formal**	351	26%	36%	26%	7%	5%
	Informal	351	24%	47%	23%	4%	1%
State	**Lagos**	234	40%	23%	26%	7%	3%
	Cross River	234	31%	35%	24%	6%	4%
	Kano	234	3%	67%	25%	3%	2%
Gender	**Male**	469	21%	45%	26%	6%	2%
	Female	233	33%	35%	22%	5%	5%
Urbanisation	**Urban**	162	29%	33%	26%	10%	2%
	Peri-urban	324	24%	47%	22%	3%	3%
	Rural	216	23%	40%	28%	6%	3%

- Radio (42%) is reported to be the main source of information among all traders irrespective of their location, gender and outlet, followed by television (25%), mobile phones (25%), newpaper/other print media (6%), friends and family (3%). In Lagos however, television (40%) is the main source of information.

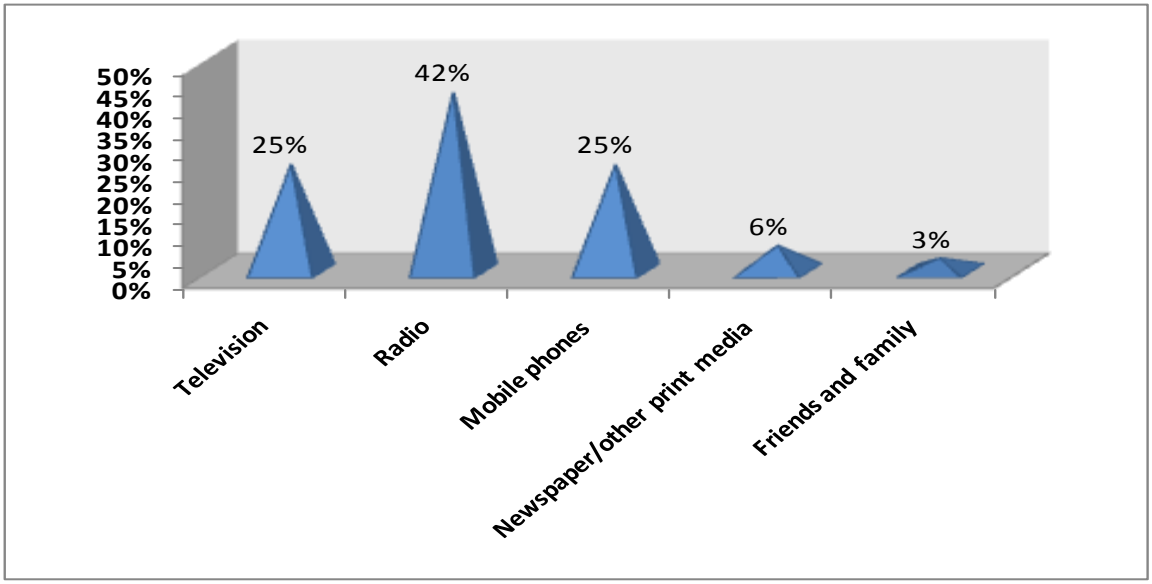


Table H1: Other sources of information for Traders

		N	Television	Radio	Mobile Phones	Prints	Family and friends	Internet
Total		702	37%	29%	24%	36%	47%	19%
Outlet	**Formal**	351	39%	32%	21%	38%	42%	24%
	Informal	351	36%	26%	27%	35%	52%	14%
State	**Lagos**	234	38%	36%	29%	41%	46%	12%
	Cross River	234	24%	27%	21%	40%	41%	29%
	Kano	234	51%	24%	23%	28%	55%	17%
Gender	**Male**	469	38%	27%	25%	36%	46%	22%
	Female	233	37%	33%	22%	37%	49%	13%
Urbanisation	**Urban**	162	38%	33%	31%	45%	48%	28%
	Peri-urban	324	39%	27%	23%	32%	47%	16%
	Rural	216	35%	29%	20%	36%	48%	18%

- Family and friends (47%), television (37%) and prints (36%) are other major sources of information for the traders.

Table H1a: Main medium traders will like to receive information on ways to enhance their business

		N	Television	Radio	Mobile phones	Newspaper/other print media	Friends and family
Total		702	25%	42%	25%	6%	3%
Outlet	**Formal**	351	26%	36%	26%	7%	5%
	Informal	351	24%	47%	23%	4%	1%
State	**Lagos**	234	40%	23%	26%	7%	3%
	Cross River	234	31%	35%	24%	6%	4%
	Kano	234	3%	67%	25%	3%	2%
Gender	**Male**	469	21%	45%	26%	6%	2%
	Female	233	33%	35%	22%	5%	5%
Urbanisation	**Urban**	162	29%	33%	26%	10%	2%
	Peri-urban	324	24%	47%	22%	3%	3%
	Rural	216	23%	40%	28%	6%	3%

- Traders will like to receive information on ways to enhance their business mainly from the radio (42%). While about two-third of the traders in Kano have radio as their main source of information, only about a quarter reported this in Lagos.

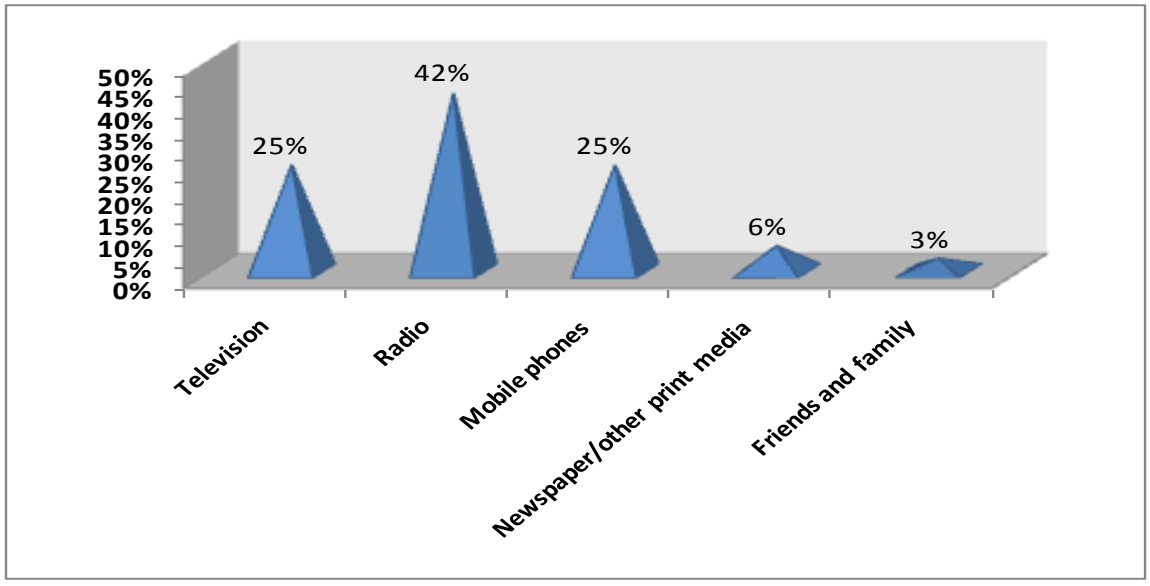


Table H2: Other medium traders will like to receive information on ways to enhance their business

		N	Television	Radio	Mobile Phones	Prints	Family and friends	Internet
Total		702	42%	36%	29%	29%	42%	15%
Outlet	**Formal**	351	40%	36%	27%	32%	42%	17%
	Informal	351	43%	36%	31%	26%	43%	13%
State	**Lagos**	234	40%	44%	40%	34%	35%	9%
	Cross River	234	31%	40%	21%	24%	36%	24%
	Kano	234	55%	24%	26%	29%	56%	13%
Gender	**Male**	469	43%	35%	27%	31%	43%	17%
	Female	233	39%	38%	33%	25%	41%	11%
Urbanisation	**Urban**	162	48%	40%	34%	33%	43%	22%
	Peri-urban	324	43%	34%	29%	28%	44%	14%
	Rural	216	35%	37%	25%	27%	39%	13%

- Family and friends (42%) as well as television (42%) are other major media traders will like to use to receive information to enhance their business.

4. CONCLUSION AND RECOMMENDATION

In-depth Interviews

The findings from this study have revealed valuable information on the commercial viability of off-grid power demand from the retail sector in Nigeria.

Our findings offer deep insight into existing and alternative energy sources, the perception and the demand for both on-grid and alternative energy and whether or not there are existing institutions or laws that affect or can the uptake of these energy sources by the retail sector. These findings and recommendations are informed and supported by the quantitative and qualitative data/information gathered from market authorities and associations, off-grid and on-grid energy providers, independent energy providers, and regulatory authorities.

Obviously, there is shortage of energy for Nigeria's growing retail sector. Already the existing formal and informal markets across states have continuously been deprived of a valuable need to develop – regular power – which they need to promote their businesses. While some markets decry the lack of regular power, many others are yet to be connected to the national grid. Yet, they must promote their small trades or businesses in order to meet their needs. Therefore, there is a strong demand for alternative energy. This was supported by evidence from the market representatives of the traders.

The most common and widely used alternative energy source by traders has been the power generating set. However, with the economic implications such as the cost of purchasing fuel (gasoline), increasing price of new generating set due to increase demand, the high cost of maintenance, noise pollution and importantly market laws/regulations that do not allow its use in some markets.

To limit the cost of using a power generating set as alternative energy, some traders have resorted to a central generating set to supply power to many businesses within a market; a model simply described as independent energy providers. The energy generated through this can meet the basic requirement of the business owners. At best, this has been the most reliable alternative source of power for the markets in Kano, and only one in Lagos and Calabar. Unfortunately, this model still uses the power generating set, only that the cost is pooled.

The discourse so far has repeatedly shown the need for a better alternative power source – the solar energy and perhaps the inverter. This underlies the strong demand for solar energy by the market representatives. These markets have space for the installation of solar panels, and they also promise adequate security. Disaggregating the level of demand for solar energy by market, although Lagos and Kano demonstrated high interest, content analysis of the qualitative responses showed Calabar are in much need of it, perhaps because of the peculiarity of the poor on-grid supply in the state.

Evidence from all stakeholders interviewed in this study showed that there are no laws/rules nor restriction in any market or by any regulatory authority on the use of solar energy or inverter as alternative energy in the markets.

It should however be noted that although there is a good level of awareness of the solar energy, much is not known about the costs of set-up and running, maintenance and reliability. This lack of adequate knowledge could be a significant factor that may determine the general acceptability and eventual take-off of any intervention, especially if it involves any financial commitment from them. Although the market authority may have a huge influence on market the decisions and outcomes, this lack of awareness may cause some delay.

The off-grid providers sampled in this study all have appreciable knowledge and experience on the sale of the various alternative energy types - generating sets, for solar panels and inverters – and are willing to provide their services to traders.

However, reaching the markets, especially traders in those markets has been a challenge. They have not provided electricity to any particular market except individuals or some organisations. They also complained about the poor/lack of awareness of solar energy among the public. They considered the cost may be too expensive for some to afford.

The sale of these alternative forms are still highly cash based, though the option of installment payment for customers is possible; it is rarely considered due to lack of trust between providers and consumers, as there is the possibility of the latter refusing to pay. Though the off-grid providers are aware of mobile money services, they have not considered it accessible and would prefer to use ATM or other forms of transactions. In addition, they confirmed access to bank loans to finance their businesses is not readily accessible and very discouraging.

According to the on-grid providers, for optimal capacity, Lagos require about 2,000 MW of energy and Kano (which also supply Katsina and some regions of Jigawa states) require 1,200MW of energy. Overall, a notable challenge in meeting the power need of customers is that the demand for power supersedes the supply. There are too many households, but less available power.

In Kano about 40% of the households are yet to have electricity from the national electricity. It was also reported that in Kano, though efforts have been made to connect these distant areas to the main electricity grid by erecting electricity poles the indigenes of the towns have refused. Likewise in Lagos and Cross River state, there are areas that are not connected to the national electricity grid.

Power is provided to trading locations in each of the three states with no restrictions in Lagos or Kano state. However in Cross River State there is a restriction on the amount of power given to the trading locations because it is dangerous to feed high amounts of energy into the trading locations for safety reasons and as such 11KVA is the standard amount transmitted to trading locations.

Quantitative Surveys among Traders

Introducing solar energy to the market will imply a great focus on the FMCG sellers since the market constitutes a whole lot of them. Other specialized market (in addition to general markets) should also be a focus, considering they consume more energy. Examples are computer village, Alaba international markets, some sections of Watt markets and other areas whose core operations require energy beside lightning and other basic features.

Considering household income and business sales, Lagos and Kano have financially buoyant traders who will be able to afford the solar energy solution. While Cross River is not as rich as others, they suffer lack of light the most, hence in dire need of alternative power solution.

Since many of the traders do not own the building where their businesses are conducted, this is definitely a factor to be borne in mind considering they might not want to make much permanent invest much on rented structures. In line with the opinion of the heads of market associations, working hand-

in-hand with market associations might be a good option to reach the traders with the solar energy solution.

For certainty, formal outlets are better market targets than informal outlets, considering their space, facilities, equipment and general energy consumption. Most of the traders currently have access to the main national electricity grid, however there is a high level of dissatisfaction and unreliability. Hence, many traders are on standby with alternative options, especially generating sets.

The afternoon and evening times need more lightning and general power consumption than the early morning. Besides, sales are higher at these periods. This is a steady pattern for most businesses, every day of the week. The traders have confirmed that good lightning play a role on determining their level of patronage, hence good lightning can also be seen as a sales enhancing factor.

In introducing solar power solution to the markets, implementers need to note that there are laws in most of the markets governing their activities, though many traders feel some of these laws are limiting their activities or trading hours.

Promising for the solar power option is the fact that most of the traders require electricity in one way or the other for their business. As mentioned earlier, there is a wide gap of sufficiency of electricity across all these locations.

Traders currently pay lot more on alternative sources than the main grid, hence paying same for solar option will definitely not be a challenge, especially if it is presented with many other advantages over its competitor; generating set. From this survey, the advantages solar option is perceived to have over generating sets include:

(i). Lesser maintenance cost

(ii) No noise or air pollution

(iii) The use of renewable energy of the sun.

In addition to the above listed opportunities, the following points could also be used to combat war against generating sets:

(i) There are newly enacted laws to charge people for noise or air pollution, coming from generating sets.
(ii) High cost of fuel in running generating sets
(iii) Risk in storing fuel, especially petrol.
(iv) Maintenance cost of generating sets

While many traders do not really know how much solar option costs or how it operates, implementers need to prepare for the perception of solar option to be very expensive, especially the installation cost.

More than half of the traders are willing to get connected to a new source or try an additional source of power. This makes the market very promising for solar option. Access to open space or security of the open space will not be a problem since most of the markets currently have security arrangement in place.

It is advisable to first target the 13% who really need energy for their core operation. However, the entire markets are worth introducing the solar power option to. Among the energy expenditures, traders currently pay highest on diesel and petrol. Hence, an avenue the solar option can take advantage of. While request from customers is a key factor is determining the range of products that traders sell, availability of electricity will surely bring positive change to their businesses. Traders are willing to pay for additional hours of electricity if it is available. Infact, if reliable power option for the whole day is available, traders will gladly embrace it, even at a cost.

Instalmental payment scheme in cash seems the best option for the solar option. Access to mobile money is very low, and its use it very minimal. In cases where traders cannot afford the solar power option, they are very unlikely to get loan from micro-finance banks or other sources to support them.

Radio, television, friends and families are very good communication channels for passing and promoting messages and increasing awareness of solar power option.

From the observations and conclusions in this study, the following recommendations are suggested:

1. First, much needs to be done in terms of knowledge and awareness of alternative energy to markets. Evidently, much still not known about solar energy and inverter. One way to achieve this is through road shows in the markets. This could be done during busy or selected market days, depending on the market type, and should be communicated in the local dialect and audio-visual means. This would promote knowledge and stimulate more interest.

2. Then an intervention to stimulate the purchase and use of alternative energy. This would include stakeholder consultation and engagement with market authority and associations to further stimulate the interest, discuss possible ways of purchasing solar energy in the market such as through micro credit, fund pooling, or other innovative ways. This is necessary as the cost of purchasing solar panel may be too expensive for individual trader.

3. A possible condition that may influence the eventual adoption of the solar energy and which was subtly expressed by some of market representatives is to be assured that there would be spare parts for products, should there be need for such. The assurance of the availability of spare parts is therefore important.

4. The availability of spare parts also may stimulate the interest and uptake of technical trainings by some traders or young people in the repairs and servicing of solar panels and inverters. Essentially, the introduction of the alternative energy may then be a source of employment for others. The chance of adopting this technology will be enhanced when traders are sure they will have people around the market to assist with repair.

5. Given the long standing poor state of grid energy in Nigeria, there is the possibility of the politicization of energy service delivery in the country, and was even mentioned by one of the market representatives when he suggested that the local government in the market of intervention should be sought, especially since most of the markets are somewhat controlled by the local government. The ministries of local government and chieftaincy affairs and environment are two possible government agencies to be engaged.

6. The adoption and use of the mobile banking is still poor, as evidenced by the off-grid energy providers. Similarly, the poor access to loans is also challenges that need appropriate interventions, as both are important in the retail market.

7. The eventual intervention program must take into consideration some sort of incentives for both the providers, e.g. the off-grid retailers and the traders. This may include involving some sort of income-generating activities to the energy-service provision, so that eventually, the markets are willing to purchase the panels because it will enhance their business and make profit. The intervention may also include discounting certain charges such as installation and free maintenance services for a certain period of time. The intervention must also put into the entire scheme the use of mobile money/services.

5. PICTURE GALLERY

Training in Lagos

Fieldwork in Lagos

Training in Cross-River

Fieldwork in Cross-River

Training in Kano

Fieldwork in Kano

COMPANY PROFILE: AGENCY CAPABILITY AND EXPERIENCE

Strategic Research and Management (STREAM) Insight is a social and market research agency, managed by seasoned social research professionals and new generation market research experts.

STREAM Insight is development oriented, and has been highly instrumental in providing technical support and data driven decisions for programme implementers and policy makers in different sectors, including many DFID supported projects, United Nations, federal government parastatals etc. We operate across the West African sub-region.

Sectors we cover include: Government parastatal, Development partners, FMCGs, Media group, Telecommunication, Banking and Finance, Oil and gas, Health etc. Our years of experience have covered: Usage and Attitude Survey, Brand Health trackers, Retail Audit and Retail Census studies, Media and advertising studies, Product tests, Consumer segmentation, Stakeholders analysis, Opinion polls for governments and countless number of social research projects etc.

STREAM Insight is a member of the Social Research Association (SRA), United Kingdom and also a member of Market Research Association (MRA) Washington DC. Our agency duly abides by the world class code of conducts of these two associations in implementing our research. STREAM Insight received the 2014 African Heart Beat Award in recognition of UNIQUE SERVICE IN SOCIAL RESEARCH.

STREAM Insight is a partner of Canback and Company LLC (Boston, USA) and their representative in West Africa. Canback and Company is a leading management consulting firm that leverages on predictive analytics and operates on a global scale to assess market opportunities for more than 500 clients in over 45 countries. Canback developed the Global Income Distribution Database (C-GIDD), the world's most comprehensive and detailed database for GDP and income distribution data. The dataset covers 211 countries, 693 subdivisions (states, provinces, etc.) and 1022 major cities from 1998 till 2018.

STREAM Insight has offices and field managers across 36 states in Nigeria, with resident interviewers and supervisors who fully understand their terrain.

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APPENDIX

Tools

	PROJECT 1262 **OFF-GRID** **IN-DEPTH INTERVIEW GUIDE** **(Energy Providers)**

OBJECTIVE

The goal of this study is to gather information and opinions on power and electricity needs of the retail sector. The information gathered will help to diagnose the problems within the sector and design interventions that facilitate systemic change in this market location. This is a study for an independent research project and it is not linked to any local or national authority or government. The information you provide is strictly confidential and your name or business identity will not be revealed.

INTRODUCTION

- Self-introduction: Your name, the research company you work with, a brief description and intention of the study.
- Respondents are pre-recruited. So, confirm you are speaking with the right person.
- Request permission to record (audio) interview and provide assurance of confidentiality.
- Let them know there is no right or wrong answer. Sincere response based on their knowledge and practices is what is highly needed.
- Let respondents know that you will be willing to pause at any point at which they need to attend to some official matters and continue after they are done.

Inclusion Criteria:

Energy providers

1. Yes (CONTINUE)
2. No (THANK AND CLOSE INTERVIEW)

	QUESTIONS
General Discussion	• Ask for respondent's..... - name - job description - work address • How long has he/she been an energy provider?

TOPIC	MAIN QUESTIONS
SOURCE OF ENERGY AND ENERGY USAGE **(Off-Grid Energy Provider Only)**	• What type of alternative power do you supply? • How does it run/operate? • Who are your current customers? • Who are your target customers? Do you target traders and trading locations? • Are there challenges in reaching your target markets • If yes, what are these challenges? • In which markets in this state do you provide electricity ? • What are your service offerings in these markets • Are trading locations in this state generally connected to the national electricity (PHCN)? Roughly what proportion of trading locations are connected to the national electricity? • Do trading locations connected to the national electricity use alternative sources of power in this state or do they rely solely on PHCN ?Please explain • How much do alternative power sources you sell , cost on average? (Classify them by capacity e.g 10KVA. 20KVA etc.) Generator____ Inverter_____ Solar_____ Others (specify)____ • What capacity do your alternative power solutions provide? (e.g 2Kva) • What type of appliances can be used with your alternative power solutions? AC or DC? What can be powered with the various power solutions you provide?

	• Are there laws that control the source of power to be used in markets in this state? • What are these laws? • Are there government regulatory laws that control the type or source of power to be used in markets? • What are these laws? • Do these laws limit the availability and use of alternative power in this market? • If yes, in what ways? • Is there anything that can be done about these laws? • If yes, what can be done? • Are there government regulatory registration fees and dues/payments that are expected to be paid by energy providers before they can operate in markets? What/how much are they? • What are your plans for market expansion in the nearest future?
SOURCE OF ENERGY AND ENERGY USAGE **(On-Grid Energy Provider Only)**	• What capacity of power is available in this state (---MW) • What capacity is required to meet the needs of this state? • What is required to operate at optimal capacity? • With the current capacity, how many hours a day; days a week; ad to roughly how many households do you supply power? • Are there challenges in meeting with the power need of your customers? If yes, what are these challenges? • Are there areas in this state that do not have electricity from the National source? Please explain • Do you provide electricity to trading locations? Are there restrictions with the amount of power which can be available in locations? • Are there government regulatory laws that control the source of power to be used in markets? What are these laws? • Do these laws limit the availability and use of national electricity in the wholesale and retail markets? If yes, in what ways? • What is the plan for power supply in the nearest future? E.g in the areas of more facilities and wider coverage. • Do people in this State use alternative sources of power? How common is the use of alternative power sources in this state?

Energy Expenditure Off-Grid Energy Provider Only	• How is payment made for the altarnative power products you sell? Upfront/Backend /instalmentally? • Roughly how much is needed to use (maintenance and fuel costs) alternative power monthly? Generators- Other (specify)_____ • What is the payment method available to your customers? Cash/POS/Bank payment/Transfer? • What payment method would you say the traders prefer when paying for power solutions • What challenges do you face with the various payment option listed • Is there an option for customers to make instalment payments for alternative power solutions? Please explain •
Sales and Income **(Off-Grid Energy Provider Only)**	• How much income does the business bring? Say monthly. • Do you have other businesses that you do besides being an energy provider? What business is this? • Do you actively try to go out and get more customers? If yes, how? • How will you describe your current level of access to mobile money services; • How will you describe your current level of access to loan facility to aid your business? • Do you face any Political challenges in doing business in this state? What challenges? • Do you face any Economic challenges, including access to credit facilities, in doing business in this state? What challenges? • Do you face any Economic challenges, including access to credit facilities, in doing business in this state? What challenges? • Do you face any social challenges, such as the social norms , in doing business in this state? What challenges? • Do you face any Technological challenges, in doing business in this state? What challenges? • Do you face any Legal/legislative challenges, in doing business in this state? What challenges? • Do you face any Environmental challenges, in doing business in this state? What challenges? •

	PROJECT 1262 **OFF-GRID** **IN-DEPTH INTERVIEW GUIDE** **(Independent Energy Providers)**

OBJECTIVE

The goal of this study is to gather information and opinions on power and electricity needs of the retail sector. The information gathered will help to diagnose the problems within the sector and design interventions that facilitate systemic change in this market location. This is a study for an independent research project and it is not linked to any local or national authority or government. The information you provide is strictly confidential and your name or business identity will not be revealed.

INTRODUCTION

- Self-introduction: Your name, the research company you work with, a brief description and intention of the study.
- Respondents are pre-recruited. So, confirm you are speaking with the right person.
- Request permission to record (audio) interview and provide assurance of confidentiality.
- Let them know there is no right or wrong answer. Sincere response based on their knowledge and practices is what is highly needed.
- Let respondents know that you will be willing to pause at any point at which they need to attend to some official matters and continue after they are done.

Inclusion Criteria:

Independent Energy Provider

3. Yes (CONTINUE)
4. No (THANK AND CLOSE INTERVIEW)

	QUESTIONS
General Discussion	• Ask for respondent's..... - name - job description - work address • How long has he/she been an independent energy provider?

TOPIC	MAIN QUESTIONS
SOURCE OF ENERGY AND ENERGY USAGE	• What type of alternative power /electricity do you provide? How does it run/operate? • How many traders, shops/outlets do you provide this service to? • What amount of energy or how many appliances can the energy provided power? • How much do you charge for this service? Are customers charged based on the number or size of appliances they have or is there a flat rate for everyone? • How many hours a day do you provide this service for? How many days a week? • How do your customers pay for the service you provide? Is payment made upfront or backend? Are instalmental payment options allowed? • Would you consider providing electricity using other energy or power sources? What other power or energy sources would you consider using?

	PROJECT 1262 **OFF-GRID** **IN-DEPTH INTERVIEW GUIDE** **(Market Associations and Authorities)**

OBJECTIVE

The goal of this study is to gather information and opinions on power and electricity needs of the retail sector. The information gathered will help to diagnose the problems within the sector and design interventions that facilitate systemic change in this market location. This is a study for an independent research project and it is not linked to any local or national authority or government. The information you provide is strictly confidential and your name or business identity will not be revealed.

INTRODUCTION

- Self-introduction: Your name, the research company you work with, a brief description and intention of the study.
- Respondents are pre-recruited. So, confirm you are speaking with the right person.
- Request permission to record (audio) interview and provide assurance of confidentiality.
- Let them know there is no right or wrong answer. Sincere response based on their knowledge and practices is what is highly needed.
- Let respondents know that you will be willing to pause at any point at which they need to attend to some official matters and continue after they are done.

Inclusion Criteria:

Member of the market associations/authorities

5. Yes (CONTINUE)
6. No (THANK RESPONDENT AND CLOSE INTERVIEW)

	QUESTIONS

General Discussion	• Ask for respondent's.....
	  - name
	  - job description
	  - work address
	• How long has he/she been a member of the market associations/regulatory bodies in the market?
	• How many members do you have in your association

TOPIC	**MAIN QUESTIONS**
SOURCE OF ENERGY AND ENERGY USAGE	• How many days per week do traders in this market trade/operate? • What time does this market operate? Inquire about the opening time and closing time, weekend operations and periods of inactiveness e.g sanitation period and others • Do traders use national electricity power source (PHCN) and/or alternative power in this market? • Which do they use more and why? • What is the availability of national electricity source (PHCN) in this market? Why is it so? • What are the types of alternative power sources available and which they use more • What is the availability of alternative power sources and why? • What are the challenges mitigating against on-grid power source? • What do the traders in this market use energy for ? • Does access to energy limit the trading activities and/or trading hours in this market? • If yes, in what way? • Like how many hours of power are needed to keep business running and why ? • What is the cost of running alternative power? How do traders perceive the affordability of alternative power? • If power were available all the time how would it change business in this market? • What products/services could additionally be offered if power constraints were removed

	• Are you aware of solar energy for generating electricity? Do you know how much it costs to set it up? Do you know how much it costs to run it? What do you think of its reliability and ease of maintenance?_____ • Are roofs or other open locations available for solar panels in this market? • What do you think about solar power for this market? (compared with generators) Why? • Would you use it? • Are generators kept in the market premises? Do traders in this market face any security challenges with their generating sets? If yes, what challenges? • If solar panels were installed on the roofs or other open spaces in this market, would they be secure? Pease explain • How secure are the goods kept permanently in shops and stores in this market? • Are there market laws governing this market? Do these laws restrict the use of alternative power sources such as generators (and others) in this market? • If yes, in what ways? • If the laws limit the use/availability of alternative power, Is there anything that can be done about these laws? • If yes, what can be done?

	PROJECT 1262 **OFF-GRID** **IN-DEPTH INTERVIEW GUIDE** **(Regulatory Bodies)**

OBJECTIVE

The goal of this study is to gather information and opinions on power and electricity needs of the retail sector. The information gathered will help to diagnose the problems within the sector and design interventions that facilitate systemic change in this market location. This is a study for an independent research project and it is not linked to any local or national authority or government. The information you provide is strictly confidential and your name or business identity will not be revealed.

INTRODUCTION

- Self-introduction: Your name, the research company you work with, a brief description and intention of what the study is all about.
- Respondents are pre-recruited. So, confirm you are speaking with the right person.
- Brief explanation of reason for the discussion.
- Explain reason for audio recording and assure on issue of confidentiality.
- Let them know there is no right or wrong answer. Sincere response based on their knowledge and practices is what is highly needed.
- Let respondents know that you will be willing to pause at any point at which they need to attend to some official matters and continue after they are done.

Inclusion Criteria:

Member of Energy board or Ministry of environment

7. Yes (CONTINUE)
8. No (THANK AND CLOSE INTERVIEW)

	QUESTIONS
General Discussion	• Ask for respondent's..... - name - job description - work address • How long has he/she been a member of the regulatory body/ministry ?
TOPIC	**MAIN QUESTIONS**
SOURCE OF ENERGY AND ENERGY USAGE	• Do wholesale and retail markets use national power (PHCN) or alternative power sources in this state? • Which do they use more and why? • What are the types of alternative power sources available and which they use more • What is the availability of this preferred power and why? • Are there market laws that control the source of power to be used in markets in this state? • What are these laws? • Are there government regulatory laws that control the source of power to be used in markets? • What are these laws? • Are there government regulatory bodies that control the operation of alternative power in markets? • What are these bodies? • Are there government regulatory laws that control the operation of alternative power in markets? • What are these laws? • Do these laws limit the availability and use of alternative power in this market? • If yes, in what ways? • Is there anything that can be done about these laws? • If yes, what can be done? • Are there government regulatory registration fees and dues/payments that are expected to be paid by energy providers before they can operate in markets? Describe in details.

	PROJECT 1262 **OFF-GRID** **FORMAL OUTLET QUESTIONNAIRE**

INTRODUCTION: Good Day Sir/Madam, my name is ……. from …….. The goal of this survey is to gather information and opinions on power and electricity needs of traders. The information gathered will help to diagnose the problems within the sector and design interventions that facilitate systemic change in this market location. This is a study for an independent research project and it is not linked to any local or national authority or government. The information you provide is strictly confidential and your name or business identity will not be revealed.

INTERVIEWER'S NAME :	
INTERVIEW STARTING TIME:	*(12-HOUR TIMING – INCLUDE AM or PM)*
INTERVIEW COMPLETING TIME:	*(12-HOUR TIMING – INCLUDE AM or PM)*
STATE:	
LOCATION	
LGA	
NAME OF MARKET:	
DATE:	

Screener Question:

S1. Are you the owner /manager of this business?

9. Yes (CONTINUE)
10. No (THANK AND CLOSE INTERVIEW)

Respondent Profile

1. Respondent Name:……..
2. Company/Business Name:……..
3. Full Address of Respondent (With landmarks):
   INT: *Do not ask, but confirm if necessary.*
   ……

   ……
4. Telephone Number: | | | | | | | | | | | |
5. Products traded?

   INT: DO NOT ASK, BUT CONFIRM IF NECESSARY. MULTIPLE CODES POSSIBLE.

   1. FMCG
   2. Fresh food
   3. Other food
   4. Electrical Appliance/Electronics
   5. Care Products/Pharmaceuticals
   6. Clothes/shoes/bags
   7. Other (specify)_____
   8. None

6. Services rendered?

INT: DO NOT ASK, BUT CONFIRM IF NECESSARY. MULTIPLE CODES POSSIBLE.

1. Tailoring
2. Hair dressing/Barbing
3. Food vending
4. Other (specify)
5. None

7. Respondent Gender:
   1. Male
   2. Female

8. Number of staff _____

SECTION A: BUSINESS PREMISES ASSESSMENT

A1. Where is the business conducted?

INT: DO NOT ASK, BUT CONFIRM IF NECESSARY. SINGLE CODE.

1. Room in a building
2. Detached building
3. .Stall
4. .Kiosk

A2. Do you own the place where you conduct business or is it rented? ***INT: SINGLE CODE.***

1. Owned
2. Rented

A3. What is the size of the place where this business is conducted? (measurement in feet)

	BY	

A4. How many rooms are used for this business?----------

INT: DO NOT ASK, BUT CONFIRM IF NECESSARY.

A5. What is this business premises used for?

INT: DO NOT ASK, BUT CONFIRM IF NECESSARY. MULTIPLE CODE POSSIBLE.

1. Sales
2. Storage
3. Administration
4. Family / individual living
5. Workshop
6. Other (specify) ----------

SECTION B: NATURE AND VOLUME OF TRADE

B1. How many hours per day do you trade/operate? **(EXACT HOURS)** ----------

INT: IF 8 HOURS AND ABOVE, SKIP TO B3.

B2. If less than 8 hours per day, why do you trade/ render services for less than 8 hours?

1. Building is shared with others
2. Security issues
3. Trading hours are so
4. Other (specify)_____

B3. How many days per week do you trade/operate? ***(EXACT NUMBER OF DAYS)*** ----------

B4. Does access to electricity or power affect your activities and/or trading hours?

1. Yes
2. No ***(SKIP TO B6)***

B5. If yes, in what way? ----------

B6. On average, what was the level of patronage to your store at the different times listed below for your last trading day and what was the average value of sales? ***INT: ASK COLUMN-WISE***

		B6a.	B6b. Customers	B6c.
		Was 'your last trading day' a 1. Week day or 2. Weekend	**Level of patronage (1. Low 2.Medium 3.High)**	**Value of Sales (Naira)**
(i)	**Morning (8am – 11:59am)**			
(ii)	**Afternoon (12 noon – 4:59pm)**			
(iii)	**Evening (5pm and afterwards)**			
(iv)	**Entire day**			

B7.Was the level of patronage' for your last trading day' similar to other days in your store?

1) Yes ***(SKIP TO B9)***
2) No

B8. If no, is the level of patronage usually more or less?

1) More
2) Less
3) Same

B9. Is there normally a difference in levels of patronage at different times of the day in your store?

1) Yes
2) No ***(SKIP TO B11)***

B10i If yes, please explain the differences

_____

B10ii If yes, please give the reason for this

_____

B11. Does the availability of good lighting/ electricity play any role in determining the level of patronage at certain times of the day?

1. Yes
2. No ***(SKIP TO B13)***

B12. If yes, please explain how the availability of good lighting/ electricity plays a role in determining the level of patronage in your store_____

B13. On average how much do you spend per week on stocking your shop? ***(EXACT AMOUNT)***

_____ (Naira)

B14. On average, excluding energy /power related costs, what additional costs do you incur in running your business (Naira)? ***INT: DO NOT READ OUT OPTIONS. WRITE EXACT.***

	Extra cost	**Naira**
1	Rent	
2	Transportation	
3	Security levy	
4	Environmental/Sanitation fee	
5	Others (Specify)_____	
6	Others (Specify)_____	
7	Others (Specify)_____	

B15. What time does this trading location open and what time does it close?
INT: TIME SHOULD BE IN THE 12 HOUR FORMAT – INCLUDE AM OR PM

B15a_Opening Time	**B15b_Closing Time**

B16. Are there laws governing the activities of this trading location? (e.g trading hours are restricted on some days)

1) Yes
2) No ***(SKIP TO B22)***

B17. If there are laws, please state them? ----------

B18. Do these laws restrict or limit your activities and/or trading hours?

1. Yes
2. No ***(SKIP TO B20)***

B19. If yes, in what way? ----------

B20. Do these laws restrict or limit the type of electricity sources you can use in this trading location?

1. Yes
2. No **(*SKIP TO B22)***

B21. If yes, in what way? ----------

B22. What is the average daily estimate of sales in your business (Naira)? ----------

SECTION C: SOURCE OF POWER AND POWER USAGE

C1. Are you connected to the main grid electricity (PHCN)?

1. Yes ***(SKIP TO C6)***
2. No

C2. Why are you not connected to the main electricity grid ? ----------

---

C3. Do you expect to be connected to the grid in the next 6 months?

1. Yes
2. No ***(SKIP TO C5)***

C4. Why do you believe you will be connected to the grid in the next 6 months? ----------

C5. How much will you have to pay to be connected to the grid? ---------- (Naira)

C6. Do you require electricity for your business?

1. Yes
2. No

C7. What is the minimum number of hours of power or electricity needed to keep your business running (per day)?

INT: WRITE EXACT AND CODE CATEGORY.

C7A. EXACT: _____

C7B. CATEGORY

1. <4 hours
2. 4-8 hours
3. 9-12 hours
4. 13-23 hours
5. 24 hours

C8. How many hours of power or electricity were available for your last trading day?

INT: WRITE EXACT AND CODE CATEGORY.

C8A. EXACT: _____ (HOURS)

C8B. CATEGORY

1. <4 hours
2. 4-8 hours
3. 9-12 hours
4. 13-23 hours
5. 24 hours

C9. Do you usually have more or less number of hours of power/electricity available?

1. Normal Situation
2. Usually less hours of power
3. Usually more hours of power

C10. How many hours of power or electricity is normally available? **(Exact hours)** _____

C11. How many days per week is electricity normally available? **(Exact days)** _____(Days)

C12. How does lack of electricity affect your business (e.g. the quality of goods; time that customers spend in the shop, No effect, etc.)

_____

C13. Has there been a change in the supply of power or electricity in the past 12 months?

1. Yes

2. No ***(SKIP TO C15)***

C14. Was this change an improvement or deterioration in the supply of power?

1. Improvement
2. Deterioration
3. No changes

C15i. How much do you pay or do you expect to pay monthly for electricity (PHCN)? ----------

C15ii. How much do you pay or do you expect to pay monthly for electricity (alternative sources)?

---------- (Naira)

C15iii. Is your power source for this business shared with other business outlets or buildings?

1. Shared
2. Not shared

C16. Do you have alternative sources of power?

1. Yes
2. No ***(SKIP TO C21)***

C17. What alternative sources of power do you have? ***INT: MULTIPLE CODES POSSIBLE***

1. Generating set
2. Solar
3. Inverter
4. Bio fuel
5. Others (specify)----------

	C18. ***INT: ASK ROW-WISE***	i. On average how many **hours a day** do you use this alternative power source	ii. On average how many **days a week** do you use this alternative power source	iii. **Fuel cost (monthly)**	iv. **Maintenance cost (monthly)**
C18a.	**Generator**				
C18b.	**Solar**				
C18c.	**Inverter**				
C18d.	**Bio fuel**				
C18e.	**Other (specify)_____**				

C19. Are you pleased with your alternative source of power?

1. Yes ***(SKIP TO C21)***
2. No

C20. If no, why? ----------

C21. Would you like to be connected to an/another alternative source of power?

1. Yes **(SKIP TO C23)**
2. No

C22. If no, why? ----------
----------**(Skip to c25)**

C23. What type of alternative source of power would you like to be connected to? (please state your top 3 choices in order of preference and give your reasons. ***INT: ASK ROW-WISE***

		i. Power source 1. Generating set 2. Solar 3. Inverter 4. Bio fuel 5.Others (specify) _____	**ii. Reason for choice**
C23a	1st choice		
C23b	2nd Choice		
C23c	3rd Choice		

C24. How much will you have to pay to be connected to the alternative source of power? ----------

INT: ASK ROW-WISE

		(i).Set up cost (including purchase of power sources)	(ii). Running Costs (monthly)
24a	Generator		
24b	Solar		
24c	Inverter		
24d	Bio fuel		
24e	Other (specify)_____		

C25. Are you familiar with solar energy for generating electricity?

1. Yes
2. No **(Skip to c33)**

C26. Do you know where to get it from if you want to purchase it?

1. Yes
2. No

C27. Do you know how much it costs?

1. Yes
2. No **(Skip to C29)**

C28. How much do the solar power solutions you know about cost? ***INT: ASK ROW-WISE***

		(i). Brief explanation of solar power solution/Type	(ii). Cost (purchase)
C28a	Solution1		
C28b	Solution2		
C28c	Solution3		

C29. Do you know how it works?

1. Yes
2. No ***(SKIP TO C33)***

C30. If yes, please explain_____

C31. In your opinion is it a reliable source of power?

1. Yes
2. No

C32. In your opinion is it easy to maintain?

1. Yes
2. No

C33. Do you have access to a roof (or other open location) for a solar panel?

1. Yes
2. No

C33a. Is this roof or other open space in a secure location?

1. Yes
2. No

C33b. What is the distance of the roof or other open space from your shop or trading location?

_____ (meters)

C34. If a cost effective solar energy solution for providing power were available, with flexible payment structure would you be willing to use it as an alternative power source?

a) Yes
b) No (Skip to C36)

C35. If yes, why?_____

C36. If no, why?_____

SECTION D: ENERGY USAGE

D1. What purposes do you currently use energy for in your enterprise? **(Multiple response possible)**

1. Lighting
2. Cooking
3. Other uses_____

D2. What equipments do you use which requires energy. ***INT: ASK ROW-WISE***

	(i) Equipment *(Tick if it is used)*	**(ii) Number/ volume/units**	**(iii) Hours used per day**	**(iv) Wattage /KVa if known**	**(v) Does this equipment use AC or DC ?**
A	Air conditioner				
B	Lighting 1. Bulb				
	2. Flourescent				
	3. Halogen lamp				
C	Refrigerator/Freezer				
D	Radio				
E	Television				
F	Fan				
G	Business equipment using power: 1.Dryer 2.Clipper 3. Sewing machines 4.Other (specify)___				
H	Mobile phone charging				
I	Kitchen equipment using power: 1.Microwave 2. Hotplate 3. Other (specify)_____				
J	Others (specify)_____				

D3. What is the minimum amount of energy/ what are the MINIMUM number and types of equipment you need to keep your business running? ***INT: ASK ROW-WISE***

	(i) Equipment	**(ii) Number/ volume/units**	**(iii) Hours used per day**	**(iv) Wattage /KVa if known**	**(v) Does this equipment use AC or DC ?**
A	Air conditioner				
B	Lighting 1. Bulb				
	2. Flourescent				
	3. Halogen lamps				
C	Refrigerator/Freezer				
D	Radio				
E	Television				
F	Fan				
G	Business equipment using power: 1.Dryer 2.Clipper 3. Sewing machines 4.Other (specify)_____				
H	Mobile phone charging				
I	Kitchen equipment using power: 1.Microwave 2. Hotplate 3. Other (specify)_____				
J	Others (specify)				

SECTION E: ENERGY EXPENDITURE

E1. In the last month how much did you spend on energy? **(Note: Including expenditure on repair and servicing)**

		Naira
E1a	Electricity (mains power/ central /National grid)	
E1b	Diesel	
E1c	Petrol	
E1d	Kerosene	
E1e	Firewood	
E1f	Coal	
E1g	Batteries (Specify if, inverter battery, generator battery or battery for torches)	
E1h	Other(specify)_____	

E2. What percentage (%) of your total business costs are currently spent on power each month? ----------

E3. How do you finance this expenditure? ***INT: DO NOT READ OUT***

1. My business cash flow
2. Loan
3. Family
4. Friends

E4. How do you make payment for this expenditure?

1. Cash
2. Cheque
3. Online transfer
4. POS
5. Mobile money
6. Others (specify……)

SECTION F: HOW WOULD YOU USE ADDITIONAL ELECTRICITY IF IT WAS AVAILABLE

F1. What factors determine the range of products or services you offer

1. Electricity
2. Requests from customers
3. Funds available
4. Store location
5. Other specify)_____

F2. If power/electricity were available all the time how would it change your business? ----------

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F3. Would it change the type of business you do (products that you sell/ services rendered)?

1. Yes
2. No **(Skip to F5)**

F4. If yes, specify the products that you will sell/ services that can be rendered----------

F5. Would it change the trading hours you do business ()?

1. Yes
2. No **(Skip to F9)**

F6. How would it change your trading hours?

1. Increase it /extend trading hours
2. Decrease /shorten trading hours **(Skip to F8)**
3. No change to trading hours **(Skip to F8)**

F7. If it will increase your trading hours, how many hours will it increase it by?

1. Increase business by 1 to just under 2 hours
2. Increase business by 2-4
3. Increase business by over 4 hours

F8 How much additional revenue could you generate by trading longer (Naira)? ----------

F9. If it will not change the trading hours or shorten your trading hours, would it have a positive impact on your sales or the quality of service you provide within your current trading hours?

1. Yes
2. No **(Skip to F11)**

F10. If yes, how much additional revenue could you generate from this positive impact on your sales or the quality of service you provide as a result of constant electricity within your current trading hours?_____

F11. Would you be willing to pay to have additional hours of reliable power/ electricity ?

1. Yes
2. No **(Skip to G1)**

F12. How much can you afford to pay for an alternative power source, if it will guarantee you reliable power for an extra 4 hours per day, based on your earnings from business?

1. Specify _____
2. No amount **(Do not read out)**

F13. How much would you pay for an alternative power source, if it will guarantee you reliable power for an extra 4 hours per day?

1. Specify _____
2. No amount **(Do not read out)**

F14. How much can you afford to pay for an alternative power source, if it will guarantee you reliable power for the whole day, based on your earnings from business?

1. Specify _____
2. No amount **(Do not read out)**

F15. How much would you pay for an alternative power source, if it will guarantee you reliable power for the whole day?

1. Specify _____
2. No amount **(Do not read out)**

F16. How do you currently pay for electricity; how would you prefer to pay and what method would you rather use? ***INT: ASK ROW-WISE***

	(i) How do you currently pay ? 1. Upfront/ bulk payment 2. Instalmentally (including- Daily/prepaid, Monthly, Pay as you use) 3. Other (specify)_____	**(ii)** How would you prefer to pay? 1. Upfront/ bulk payment 2. Instalmentally (including- Daily/prepaid, Monthly ,Pay as you use) 3. Other (specify)____	**(iii)** What payment method would you like to pay with 1. Cash at service providers' office or payment locations 2. POS at service providers' office or payment locations 3. Recharge cards 4. Other (specify)_____
A. Main grid electricity			
B. Generator			
C. Solar			
D. Inverter			
E. Bio fuel			
F. Other (specify)_____			

SECTION G: ACCESS TO SERVICES

G1. Do you have a mobile phone?

1. Yes
2. No

G2. Do you have access to mobile money services?

1. Yes
2. No **(Skip to G5)**

G3 Do you use mobile money services?

G4. If yes, which service? ----------

G5. Have you borrowed any money from a micro-finance organization?

1. Yes **(Skip to G7)**
2. No

G6 If no, why have you not borrowed any money from a micro-finance organization?

_____

G7. Do you have a bank account?

1. Yes
2. No **(Skip to G9)**

G8. If yes, are you able to access credit facilities from your bank? ----------

G9. Do you have access to any other financial services (i.e. insurance, savings, etc)?

1. Yes
2. No **(Skip to H1)**

G10. If yes, which services? ----------

SECTION H: COMMUNICATION CHANNELS

H1. What is your main source of information? *INT: Ask for other sources*

H1a. MAIN (Single code)		**H1b. OTHERS** (Multiple response)	
1	Television	1	Television
2	Radio	2	Radio
3	Mobile phones	3	Mobile phones
4	Newspaper/other print media	4	Newspaper/other print media
5	Friends and family	5	Friends and family
6	Internet	6	Internet
7	Others (specify)_____	7	Others (specify)_____

H2. If you were to receive information on ways to enhance your business, what medium would you like it to be sent through? *INT: Ask for main and other sources*

H2a. MAIN (Single code)		**H2b. OTHERS** (Multiple response)	
1	Television	1	Television
2	Radio	2	Radio
3	Mobile phones	3	Mobile phones
4	Newspaper/other print media	4	Newspaper/other print media
5	Friends and family	5	Friends and family
6	Internet	6	Internet
7	Others (specify)_____	7	Others (specify)_____

SECTION J: DEMOGRAPHERS

J1. How old are you?

Exact Age	……
18 – 21 years	1
22 – 34 years	2
35 – 44 years	3
45 – 54 years	4
55 – 65 years	5
Above 65 years	6

J2. What religion do you practice?

1. Moslem
2. Christian
3. Traditionalist
4. Agnostic/Atheist
5. Other (specify)_____

J3. How many people in total live in your house? Household size _____

J4. How many of these people contribute to your total household income _____

J5(i) . What is the total income to your household (including those earned by other household members) per month? _____

J5(ii) INTERVIEWER: If respondent is not willing to specify then use ranges below

1. 0 – 20,000
2. 20,001 – 41,477
3. 41,478 – 60, 000
4. 60,001 – 80,000
5. 80,001 – 100,000
6. 120,001 – 140,000
7. 140,001 – 160,000
8. More than 160, 000
9. Don't know

J6. Which one of these phrases comes closest to your own feelings about your household's income these days? **(Read 1-4)**

1. Living comfortably on present income
2. Getting by on present income
3. Finding it difficult on present income
4. Finding it very difficult on present income
5. Don't know
6. Refused

J7. Do you save part of your income regularly (apart from the money put back into your business)?

1. No
2. Yes

J8. In times of emergency (e.g sudden illness or death) what do you do?

1. Ask for help or borrow money from relatives
2. Ask for help or borrow money from friends or neighbours
3. Use personal savings
4. Borrow from bank, local money dealers
5. Other (specify)_____

J9. On average, how much do you spend each week on airtime for personal use? _____

THANK YOU FOR YOUR TIME

SUPERVISOR:		
FIELD MANAGER :		
BACK CHECKED BY QC OFFICER :		
COORDINATE	***Lat:***	***Long:***

	**PROJECT 1262** **OFF-GRID** **INFORMAL OUTLET QUESTIONNAIRE**

INTRODUCTION: Good Day Sir/Madam, my name is ……. from ……. The goal of this survey is to gather information and opinions on power and electricity needs of traders. The information gathered will help to diagnose the problems within the sector and design interventions that facilitate systemic change in this market location. This is a study for an independent research project and it is not linked to any local or national authority or government. The information you provide is strictly confidential and your name or business identity will not be revealed.

INTERVIEWER'S NAME :	
INTERVIEW STARTING TIME:	*(12-HOUR TIMING – INCLUDE AM or PM)*
INTERVIEW COMPLETING TIME:	*(12-HOUR TIMING – INCLUDE AM or PM)*
STATE:	
LOCATION	
LGA	
NAME OF MARKET:	
DATE:	

Screener Question:

S1. Are you the owner /manager of this business?

11. Yes (CONTINUE)
12. No (THANK AND CLOSE INTERVIEW)

Respondent Profile

15. Respondent Name:……..
16. Company/Business Name:……..
17. Full Address of Respondent (With landmarks):
    INT: *Do not ask, but confirm if necessary.*
    ……

    ……

9. Telephone Number:

10. Products traded?

    INT: DO NOT ASK, BUT CONFIRM IF NECESSARY. MULTIPLE CODES POSSIBLE.

    9. FMCG
    10. Fresh food
    11. Other food
    12. Electrical Appliance/Electronics
    13. Care Products/Pharmaceuticals
    14. Clothes/shoes/bags
    15. Other (specify)_____
    16. None

11. Services rendered?

    INT: DO NOT ASK, BUT CONFIRM IF NECESSARY. MULTIPLE CODES POSSIBLE.

    6. Tailoring
    7. Hair dressing/Barbing
    8. Food vending
    9. Other (specify)
    10. None

12. Respondent Gender:
    1. Male
    2. Female

13. Number of staff _____

SECTION A: BUSINESS PREMISES ASSESSMENT

A1. Where is the business conducted?

INT: DO NOT ASK, BUT CONFIRM IF NECESSARY. SINGLE CODE.

5. Room in a building
6. Detached building
7. Stall
8. Kiosk

A2. Do you own the place where you conduct business or is it rented? ***INT: SINGLE CODE.***

3. Owned
4. Rented

A3. What is the size of the place where this business is conducted? (measurement in feet)

	BY	

A4. How many rooms are used for this business?----------

INT: DO NOT ASK, BUT CONFIRM IF NECESSARY.

A5. What is this business premises used for?

INT: DO NOT ASK, BUT CONFIRM IF NECESSARY. MULTIPLE CODES POSSIBLE.

7. Sales
8. Storage
9. Administration
10. Family / individual living
11. Workshop
12. Other (specify) ----------

SECTION B: NATURE AND VOLUME OF TRADE

B1. How many hours per day do you trade/operate? **(EXACT HOURS)** ----------

INT: IF 8 HOURS AND ABOVE, SKIP TO B3.

B2. If less than 8 hours per day, why do you trade/ render services for less than 8 hours?

5. Building is shared with others
6. Security issues
7. Trading hours are so
8. Other (specify)_____

B3. How many days per week do you trade/operate? ***(EXACT NUMBER OF DAYS)*** ----------

B4. Does access to electricity or power affect your activities and/or trading hours?

3. Yes
4. No ***(SKIP TO B6)***

B5. If yes, in what way? ----------

B6. On average, what was the level of patronage to your store at the different times listed below for your last trading day and what was the average value of sales? ***INT: ASK COLUMN-WISE***

		B6a.	B6b. Customers	B6c.
		Was 'your last trading day' a 1. Week day or 2. Weekend	**Level of patronage (1. Low 2.Medium 3.High)**	**Value of Sales (Naira)**
(i)	**Morning (8am – 11:59am)**			
(ii)	**Afternoon (12 noon – 4:59pm)**			
(iii)	**Evening (5pm and afterwards)**			
(iv)	**Entire day**			

B7.Was the level of patronage' for your last trading day' similar to other days in your store?

1) Yes ***(SKIP TO B9)***
2) No

B8. If no, is the level of patronage usually more or less?

1) More
2) Less
3) Same

B9. Is there normally a difference in levels of patronage at different times of the day in your store?

1) Yes
2) No ***(SKIP TO B11)***

B10i If yes, please explain the differences

_____

B10ii If yes, please give the reason for this

_____

B11. Does the availability of good lighting/ electricity play any role in determining the level of patronage at certain times of the day?

1. Yes
2. No ***(SKIP TO B13)***

B12. If yes, please explain how the availability of good lighting/ electricity plays a role in determining the level of patronage in your store_____

B13. On average how much do you spend per week on stocking your shop? ***(EXACT AMOUNT)***

_____ (Naira)

B14. On average, excluding energy /power related costs, what additional costs do you incur in running your business (Naira)? ***INT: DO NOT READ OUT OPTIONS. WRITE EXACT.***

	Extra cost	**Naira**
1	Rent	
2	Transportation	
3	Security levy	
4	Environmental/Sanitation fee	
5	Others (Specify)_____	
6	Others (Specify)_____	
7	Others (Specify)_____	

B15. What time does this trading location open and what time does it close?
INT: TIME SHOULD BE IN THE 12 HOUR FORMAT – INCLUDE AM OR PM

B15a_Opening Time	**B15b_Closing Time**

B16. Are there laws governing the activities of this trading location? (e.g trading hours are restricted on some days)

1) Yes
2) No ***(SKIP TO B22)***

B17. If there are laws, please state them? ----------

B18. Do these laws restrict or limit your activities and/or trading hours?

3. Yes
4. No ***(SKIP TO B20)***

B19. If yes, in what way? ----------

B20. Do these laws restrict or limit the type of electricity sources you can use in this trading location?

3. Yes
4. No **(*SKIP TO B22)***

B21. If yes, in what way? ----------

B22. What is the average daily estimate of sales in your business (Naira)? ----------

SECTION C: SOURCE OF POWER AND POWER USAGE

C1. Are you connected to the main grid electricity (PHCN)?

3. Yes ***(SKIP TO C6)***
4. No

C2. Why are you not connected to the main electricity grid ? ----------

---

C3. Do you expect to be connected to the grid in the next 6 months?

3. Yes
4. No ***(SKIP TO C5)***

C4. Why do you believe you will be connected to the grid in the next 6 months? ----------

C5. How much will you have to pay to be connected to the grid? ---------- (Naira)

C6. Do you require electricity for your business?

3. Yes
4. No

C7. What is the minimum number of hours of power or electricity needed to keep your business running (per day)?

INT: WRITE EXACT AND CODE CATEGORY.

C7A. EXACT: _____

C7B. CATEGORY

6. <4 hours
7. 4-8 hours
8. 9-12 hours
9. 13-23 hours
10. 24 hours

C8. How many hours of power or electricity were available for your last trading day?

INT: WRITE EXACT AND CODE CATEGORY.

C8A. EXACT: _____ (HOURS)

C8B. CATEGORY

6. <4 hours
7. 4-8 hours
8. 9-12 hours
9. 13-23 hours
10. 24 hours

C9. Do you usually have more or less number of hours of power/electricity available?

4. Normal Situation
5. Usually less hours of power
6. Usually more hours of power

C10. How many hours of power or electricity is normally available? **(Exact hours)** _____

C11. How many days per week is electricity normally available? **(Exact days)** _____(Days)

C12. How does lack of electricity affect your business (e.g. the quality of goods; time that customers spend in the shop, No effect, etc.)

_____

C13. Has there been a change in the supply of power or electricity in the past 12 months?

3. Yes

4. No ***(SKIP TO C15)***

C14. Was this change an improvement or deterioration in the supply of power?

4. Improvement
5. Deterioration
6. No changes

C15i. How much do you pay or do you expect to pay monthly for electricity (PHCN)? ----------

C15ii. How much do you pay or do you expect to pay monthly for electricity (alternative sources)?

---------- (Naira)

C15iii. Is your power source for this business shared with other business outlets or buildings?

3. Shared
4. Not shared

C16. Do you have alternative sources of power?

3. Yes
4. No ***(SKIP TO C21)***

C17. What alternative sources of power do you have? ***INT: MULTIPLE CODES POSSIBLE***

6. Generating set
7. Solar
8. Inverter
9. Bio fuel
10. Others (specify)----------

	C18. ***INT: ASK ROW-WISE***	i. On average how many **hours a day** do you use this alternative power source	ii. On average how many **days a week** do you use this alternative power source	iii. **Fuel cost (monthly)**	iv. **Maintenance cost (monthly)**
C18a.	**Generator**				
C18b.	**Solar**				
C18c.	**Inverter**				
C18d.	**Bio fuel**				
C18e.	**Other (specify)_____**				

C19. Are you pleased with your alternative source of power?

3. Yes ***(SKIP TO C21)***

4. No

C20. If no, why? ----------

C21. Would you like to be connected to an/another alternative source of power?

3. Yes **(SKIP TO C23)**
4. No

C22. If no, why? ----------

----------**(Skip to c25)**

C23. What type of alternative source of power would you like to be connected to? (please state your top 3 choices in order of preference and give your reasons. ***INT: ASK ROW-WISE***

		i. Power source 1. Generating set 2. Solar 3. Inverter 4. Bio fuel 5.Others (specify) _____	**ii. Reason for choice**
C23a	1st choice		
C23b	2nd Choice		
C23c	3rd Choice		

C24. How much will you have to pay to be connected to the alternative source of power? ----------

INT: ASK ROW-WISE

		(i).Set up cost (including purchase of power sources)	(ii). Running Costs (monthly)
24a	Generator		
24b	Solar		
24c	Inverter		
24d	Bio fuel		
24e	Other (specify)_____		

C25. Are you familiar with solar energy for generating electricity?

3. Yes
4. No **(Skip to c33)**

C26. Do you know where to get it from if you want to purchase it?

3. Yes
4. No

C27. Do you know how much it costs?

3. Yes
4. No **(Skip to C29)**

C28. How much do the solar power solutions you know about cost? ***INT: ASK ROW-WISE***

		(i). Brief explanation of solar power solution/Type	(ii). Cost (purchase)
C28a	Solution1		
C28b	Solution2		
C28c	Solution3		

C29. Do you know how it works?

3. Yes
4. No ***(SKIP TO C33)***

C30. If yes, please explain_____

C31. In your opinion is it a reliable source of power?

3. Yes
4. No

C32. In your opinion is it easy to maintain?

3. Yes
4. No

C33. Do you have access to a roof (or other open location) for a solar panel?

3. Yes
4. No

C33a. Is this roof or other open space in a secure location?

1. Yes
2. No

C33b. What is the distance of the roof or other open space from your shop or trading location?

_____ (meters)

C34. If a cost effective solar energy solution for providing power were available, with flexible payment structure would you be willing to use it as an alternative power source?

c) Yes
d) No (Skip to C36)

C35. If yes, why?_____

C36. If no, why?_____

SECTION D: ENERGY USAGE

D1. What purposes do you currently use energy for in your enterprise? **(Multiple response possible)**

4. Lighting
5. Cooking
6. Other uses_____

D2. What equipments do you use which requires energy. ***INT: ASK ROW-WISE***

	(i) Equipment *(Tick if it is used)*	**(ii) Number/ volume/units**	**(iii) Hours used per day**	**(iv) Wattage /KVa if known**	**(v) Does this equipment use AC or DC ?**
A	Air conditioner				
B	Lighting 1. Bulb				
	2. Flourescent				
	3. Halogen lamp				
C	Refrigerator/Freezer				
D	Radio				
E	Television				
F	Fan				
G	Business equipment using power: 1.Dryer 2.Clipper 3. Sewing machines 4.Other (specify)___				
H	Mobile phone charging				
I	Kitchen equipment using power: 1.Microwave 2. Hotplate 3. Other (specify)_____				
J	Others (specify)_____				

D3. What is the minimum amount of energy/ what are the MINIMUM number and types of equipment you need to keep your business running? ***INT: ASK ROW-WISE***

	(i) Equipment	**(ii) Number/ volume/units**	**(iii) Hours used per day**	**(iv) Wattage /KVa if known**	**(v) Does this equipment use AC or DC ?**
A	Air conditioner				
B	Lighting 1. Bulb				
	2. Flourescent				
	3. Halogen lamps				
C	Refrigerator/Freezer				
D	Radio				
E	Television				
F	Fan				
G	Business equipment using power: 1.Dryer 2.Clipper 3. Sewing machines 4.Other (specify)_____				
H	Mobile phone charging				
I	Kitchen equipment using power: 1.Microwave 2. Hotplate 3. Other (specify)_____				
J	Others (specify)				

SECTION E: ENERGY EXPENDITURE

E1. In the last month how much did you spend on energy? **(Note: Including expenditure on repair and servicing)**

		Naira
E1a	Electricity (mains power/ central /National grid)	
E1b	Diesel	
E1c	Petrol	
E1d	Kerosene	
E1e	Firewood	
E1f	Coal	
E1g	Batteries (Specify if, inverter battery, generator battery or battery for torches)	
E1h	Other(specify)_____	

E2. What percentage (%) of your total business costs are currently spent on power each month? ----------

E3. How do you finance this expenditure? ***INT: DO NOT READ OUT***

5. My business cash flow
6. Loan
7. Family
8. Friends

E4. How do you make payment for this expenditure?

7. Cash
8. Cheque
9. Online transfer
10. POS
11. Mobile money
12. Others (specify……)

SECTION F: HOW WOULD YOU USE ADDITIONAL ELECTRICITY IF IT WAS AVAILABLE

F1. What factors determine the range of products or services you offer

6. Electricity
7. Requests from customers
8. Funds available
9. Store location
10. Other specify)_____

F2. If power/electricity were available all the time how would it change your business? ----------

---

F3. Would it change the type of business you do (products that you sell/ services rendered)?

3. Yes
4. No **(Skip to F5)**

F4. If yes, specify the products that you will sell/ services that can be rendered----------

F5. Would it change the trading hours you do business ()?

3. Yes
4. No **(Skip to F9)**

F6. How would it change your trading hours?

4. Increase it /extend trading hours
5. Decrease /shorten trading hours **(Skip to F8)**
6. No change to trading hours **(Skip to F8)**

F7. If it will increase your trading hours, how many hours will it increase it by?

4. Increase business by 1 to just under 2 hours
5. Increase business by 2-4
6. Increase business by over 4 hours

F8 How much additional revenue could you generate by trading longer (Naira)? ----------

F9. If it will not change the trading hours or shorten your trading hours, would it have a positive impact on your sales or the quality of service you provide within your current trading hours?

3. Yes
4. No **(Skip to F11)**

F10. If yes, how much additional revenue could you generate from this positive impact on your sales or the quality of service you provide as a result of constant electricity within your current trading hours?_____

F11. Would you be willing to pay to have additional hours of reliable power/ electricity ?

3. Yes
4. No **(Skip to G1)**

F12. How much can you afford to pay for an alternative power source, if it will guarantee you reliable power for an extra 4 hours per day, based on your earnings from business?

3. Specify _____
4. No amount **(Do not read out)**

F13. How much would you pay for an alternative power source, if it will guarantee you reliable power for an extra 4 hours per day?

3. Specify _____
4. No amount **(Do not read out)**

F14. How much can you afford to pay for an alternative power source, if it will guarantee you reliable power for the whole day, based on your earnings from business?

3. Specify _____
4. No amount **(Do not read out)**

F15. How much would you pay for an alternative power source, if it will guarantee you reliable power for the whole day?

3. Specify _____
4. No amount **(Do not read out)**

F16. How do you currently pay for electricity; how would you prefer to pay and what method would you rather use? ***INT: ASK ROW-WISE***

	(i) How do you currently pay ? 1. Upfront/ bulk payment 2. Instalmentally (including- Daily/prepaid, Monthly, Pay as you use) 3. Other (specify)_____	**(ii)** How would you prefer to pay? 1. Upfront/ bulk payment 2. Instalmentally (including- Daily/prepaid, Monthly ,Pay as you use) 3. Other (specify)____	**(iii)** What payment method would you like to pay with 1. Cash at service providers' office or payment locations 2. POS at service providers' office or payment locations 3. Recharge cards 4. Other (specify)_____
A. Main grid electricity			
B. Generator			
C. Solar			
D. Inverter			
E. Bio fuel			
F. Other (specify)_____			

SECTION G: ACCESS TO SERVICES

G1. Do you have a mobile phone?

3. Yes
4. No

G2. Do you have access to mobile money services?

3. Yes
4. No **(Skip to G5)**

G3 Do you use mobile money services?

G4. If yes, which service? ----------

G5. Have you borrowed any money from a micro-finance organization?

3. Yes **(Skip to G7)**
4. No

G6 If no, why have you not borrowed any money from a micro-finance organization?

_____

G7. Do you have a bank account?

3. Yes
4. No **(Skip to G9)**

G8. If yes, are you able to access credit facilities from your bank? ----------

G9. Do you have access to any other financial services (i.e. insurance, savings, etc)?

3. Yes
4. No **(Skip to H1)**

G10. If yes, which services? ----------

SECTION H: COMMUNICATION CHANNELS

H1. What is your main source of information? *INT: Ask for other sources*

H1a. MAIN (Single code)		**H1b. OTHERS** (Multiple response)	
1	Television	1	Television
2	Radio	2	Radio
3	Mobile phones	3	Mobile phones
4	Newspaper/other print media	4	Newspaper/other print media
5	Friends and family	5	Friends and family
6	Internet	6	Internet
7	Others (specify)_____	7	Others (specify)_____

H2. If you were to receive information on ways to enhance your business, what medium would you like it to be sent through? *INT: Ask for main and other sources*

H2a. MAIN (Single code)		**H2b. OTHERS** (Multiple response)	
1	Television	1	Television
2	Radio	2	Radio
3	Mobile phones	3	Mobile phones
4	Newspaper/other print media	4	Newspaper/other print media
5	Friends and family	5	Friends and family
6	Internet	6	Internet
7	Others (specify)_____	7	Others (specify)_____

SECTION J: DEMOGRAPHERS

J1. How old are you?

Exact Age	……
18 – 21 years	1
22 – 34 years	2
35 – 44 years	3
45 – 54 years	4
55 – 65 years	5
Above 65 years	6

J2. What religion do you practice?

6. Moslem
7. Christian
8. Traditionalist
9. Agnostic/Atheist
10. Other (specify)_____

J3. How many people in total live in your house? Household size _____

J4. How many of these people contribute to your total household income _____

J5(i) . What is the total income to your household (including those earned by other household members) per month? _____

J5(ii) INTERVIEWER: If respondent is not willing to specify then use ranges below

10. 0 – 20,000
11. 20,001 – 41,477
12. 41,478 – 60, 000
13. 60,001 – 80,000
14. 80,001 – 100,000
15. 120,001 – 140,000
16. 140,001 – 160,000
17. More than 160, 000
18. Don't know

J6. Which one of these phrases comes closest to your own feelings about your household's income these days? **(Read 1-4)**

7. Living comfortably on present income
8. Getting by on present income
9. Finding it difficult on present income
10. Finding it very difficult on present income
11. Don't know
12. Refused

J7. Do you save part of your income regularly (apart from the money put back into your business)?

3. No
4. Yes

J8. In times of emergency (e.g sudden illness or death) what do you do?

6. Ask for help or borrow money from relatives
7. Ask for help or borrow money from friends or neighbours
8. Use personal savings
9. Borrow from bank, local money dealers
10. Other (specify)_____

J9. On average, how much do you spend each week on airtime for personal use? _____

THANK YOU FOR YOUR TIME

SUPERVISOR:		
FIELD MANAGER :		
BACK CHECKED BY QC OFFICER :		
COORDINATE	***Lat:***	***Long:***