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NIGERIA Stand Alone Off-Grid Solar Market Research

















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Introduction Nigeria Off-Grid Solar Opportunity





The government plans to achieve 100% electrification by 2040, with 5% via stand-alone solar (SAS). The SAS sector has witnessed significant growth – **324,000 SAS units** sold in 2019, up from negligible sales five years earlier.



The OGS market opportunity is estimated at **USD 9.2 billion** per year.







Introduction Objective & Methodology

Objective

This research provides industry stakeholders with an insightful and up to date overview on the development of the SAS market with specific consideration for if, and how, communities are gaining access.

Methodology

Quantitative and qualitative data collection in rural, peri-urban, and urban areas across 10 states – Abia, Bauchi, Cross River, Ebonyi, Edo, Ekiti, Kano, Kogi, Oyo, and Plateau.



Quantitative

Census of all trade outlets within mapped out areas, followed by 'deep dives' of sampled SAS-dealing outlets, specialised technician shops, and consumers (households and MSMEs).



Qualitative

In-depth interviews with SAS traders, solar companies, MFIs, local cooperatives, NGOs, and government.







Introduction Objective & Methodology

SAS Products Evaluated



Solar Lanterns:

Single-piece solar lantern with an integrated or connected solar panel. Typically with capacity of 10W or less.



Solar Home System:

A complete integrated unit consisting of a solar panel, multiple lighting points, control unit, and associated DC appliances. Typically, between 10W – 350W.



Solar Panels:

A solar panel that is independently sourced and coupled with other components such as batteries, charge controllers, inverters, and wiring into a solar power solution. Capacity varies with design.







Key Findings Distribution Channels

Trade Vs Non-Trade



Trade channels - trader shops, electronic stores, and general stores that stock solar products - and non-trade channels - solar companies, SAS brand representatives/agents, last mile distributors, alternative channels such as MFIs - are largely parallel markets.



Just 13.6% of potential trade outlets for SAS products are actually stocking SAS, pointing to an 86.4% opportunity to expand the SAS market.



Trade channels seem to be the main source of SAS distribution, however non-trade channels are increasing penetration particularly through agent networks.



Solar lanterns have the highest sales in trade channels than SHS and panels. SHS products are still a specialty item (just 1%) and move primarily through non-trade channels, pointing to a largely untapped market in trade channels. Most productive solar appliances are still nascent with less than 5% penetration at the trade level.







Key Findings Distribution Channels

Product Penetration



High SAS penetration tends to correlate with low grid connection rates, but not always. Generally, there is low consumer awareness of value of SAS products.



SAS use is higher in peri-urban areas (72%) than rural areas (22%) by both households and MSMEs despite more demand in the latter. **Imbalanced access means the rural poor pay more** to access SAS products and after-sales services.



27% of households use SAS products. Nearly a third of them also have generators, and others use kerosene lamps, candles, or firewood for lighting. **Solar is mostly playing a backup role for households.**

Consumer Preference



Trader's choice of SAS products to stock are driven by customer preference, profit margin, and supplier recommendation.



66% of consumers surveyed have multiple uses of SAS mainly phone charging, lighting, and powering television and radio.



Affordability, safety, trust, availability, and quality, drive consumer product choice. Consumers typically rely on trader recommendations.







Key Findings Product Preference

Consumer Preference

Most traders believe there is moderate **to high presence of SAS product counterfeits**, mainly in urban areas. Traders however judge quality by assessing certain product features including the availability of a warranty, or performance. Less than 50% of traders could identify a quality product by quality standards.



Consumers are also largely unable to identify a quality product and judge quality by the availability or not of a warranty.



Quality and pricing vary widely presenting a confusing market for consumers. Major price discrepancies for what appears to be the same product point to the prevalence of counterfeits.



Lack of quality verification can either mean a product is poor quality or has not (yet) been tested. The popularity of some non-quality verified brands may warrant the need for quality testing.



Presence of quality verified (QV) SHS is remarkably high compared to other SAS product types. However, a very small number of SHS products was surveyed compared to other product types, as SHS was more of a specialty product.







Key Findings Product Characteristics

Product Quality





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Key Findings Financing

Supply Chain Financing



Financing within the trade supply chain is available at low levels. Just 17% of traders have received supply credit and only 4% have secured any form of supply finance (debt) – mainly from MFIs and commercial banks. Most traders are not aware of financial institutions that offer financing.



Loan amounts vary between 50,000 - 1,000,000 Naira with short repayment periods. Traders tend to use their land title deed or product stock as collateral.





Sale of SAS products in trade channels are almost exclusively in upfront cash payments, with very little credit extended to consumers.

Where credit or consumer finance is available, repayment periods vary dependent on the source– If credit is from traders, typically 1 month. If from MFIs, typically between 6 to 12 months with an average monthly interest of 3.2% plus a 10% processing fee.

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In instances of default, traders cited loss of income as the primary reason given by the consumer. Other reasons include competing priorities (37%), poor product performance (24%), and interest rate (16%).



PAYG is specific to, and gaining traction for consumer financing of SHS products.







Key Findings After-Sales Service

Technical Support / **Repairs**

E-Waste

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After-sales service for SAS is low which could potentially be impacting the perception of their value.

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These are provided by only a few traders, with consumers relying a lot on independent technicians for installation and repairs.



Most technicians that offer solar services are self-taught or have learned through apprenticeship. There are very few specialised solar technicians.



Consumers have no e-waste disposal plan for their SAS products when either broken or at end-of-life – pointing to a possible glut of e-waste.



Disposal plans by traders for broken or end-of-life SAS products include return to supplier, sale as scrap, or disposal as general waste.







Key Findings Gender & Social Inclusion









Key Findings Impact Of Covid-19



Most traders (87%) were negatively impacted by the covid-19 pandemic. Traders reported higher cost of stock (52%), business closure due to curfew and lockdowns (46%), reduced patronage (41%), reduced training hours (38%), and challenges in restocking (38%) between March and May 2020.



Similarly on the consumer side, 72% of households and 58% of MSMEs reported a "slight to significantly worse" impact of covid-19 on energy costs and access to SAS products.









Recommendations General Recommendation

Government

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Facilitate SAS delivery through trade and non-trade channels particularly in rural areas

- Develop localised policies and strategies that promote SAS electrification. Improve the existing regulatory framework to support SAS delivery such as scaling digital payment services.
- Enforce quality standards for solar products at the point of import and in the market.
- \bigcirc Provide end user subsidies, consumer finance, tax waivers or fiscal privileges to incentivize quality SAS products and improve SAS affordability
- \bigcirc Public awareness and education on SAS electrification and its socio-economic benefits.
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 - Provide training and skills acquisition programmes on SAS to build entrepreneurship, technical and non-technical skills, and create jobs opportunities







Recommendations General Recommendation

Private Sector



There is substantial untapped market opportunity for SAS companies to meet the latent demand in rural areas through collaboration with mainstream trade channels which offer increased consumer penetration.



- Exploring opportunities with trade channels can increase SAS delivery, and increase quality SAS products in the trade channels. The industry association can facilitate engagements with trade associations across the country.



- Market development organisations and geospatial data providers can provide granular trade data to help SAS companies identify potential expansion opportunities across the country.



- Donor partners and multilateral finance institutions could design grant funding tools and technical assistance that incentivises development of trade relationships that improve quality SAS delivery through trade channels or investor readiness support.







Recommendations Stakeholder Action

The following are areas for action and support, and the actors who could lead such efforts, to build the SAS market and improve the value and experience of solar for vulnerable populations:

A multi-faceted effort to boost the prevalence, delivery, affordability and awareness of quality SAS products, and its socio-economic benefits

Area	Action	Led by	Secondary Support
Quality Standards	Enforce quality standards at points of import and in the retail chain. Expand quality testing to popular non-QV products to access quality	Standards Organisation of Nigeria; Nigeria Customs Service; VeraSol	Rural Electrification Agency; Industry association; Donor partners
Capacity Building	Training and guidance to traders alongside product demonstration to build capacity on quality, financing, consumer education and providing after-sales service	Standards Organisation of Nigeria	VeraSol, development partners, industry association
	Provide ongoing vocational training to build entrepreneurship, technical and non-technical skills, and create jobs opportunities	Vocational training centres; government training institutes such as the National Power Training Institute of Nigeria (NAPTIN)	Donor partners, industry association, NGOs
Consumer Awareness	Consumer awareness campaigns to sensitise on the benefits of SAS products including identifying quality products, financing options, productive uses, e-waste management, and other benefits	Industry Association; Donor / Development Partners	VeraSol; Rural Electrification Agency; Consumer Protection Council
Gender and Social Inclusion (GESI)	Targeted programmes to increase the inclusion of women, youth and vulnerable groups in the SAS trade and non-trade channels, and create more GESI focused empowerment opportunities	Donor partners; Rural Electrification Agency; Federal and state government MDAs on gender and social inclusion	Industry Association; relevant NGOs







Recommendations Stakeholder Action

Area	Action	Led by	Secondary Support
Retail Penetration	Facilitate partnerships between SAS companies, brand owners, and traders (distributors and retailers) to increase quality SAS product delivery particularly in rural communities	Industry association	Donor Partners
	Build out non-trade distribution options - such as MFIs, cooperatives and social groups - that have closer access to rural communities. They can be explored as partners / representatives / franchises for SAS companies and brand owners	Industry association	Donor Partners
Supply Chain & Consumer Financing Facilitate partnerships between investors, financiers, and MFIs to increase supply and consumer finance for traders and consumers to scale SAS delivery and affordability		Donor partners, Industry association	Relevant federal and state government MDAs such as the Central Bank of Nigeria
Policy &	Provide incentives, such as results-based financing, end-user subsidy, or tax waivers, to encourage SAS companies, brand owners, and traders expand to rural and more vulnerable areas	Rural Electrification Agency, relevant federal and state government MDAs	Donor / Development partners; Industry Association
Regulatory Reform	Improve digital payment solutions such as PAYG, and alternative consumer financing models	Central Bank of Nigeria, Rural Electrification Agency	Donor / Development partners, Industry association







State Summary Supply Penetration

Opportunity to expand SAS product delivery exists across the country such as Oyo, Cross River., Bauchi and Plateau



Zone	State	Trade outlets counted	Solar penetration	Grid	Population estimate
OW	Оуо	2,973	5.7%	67%	7,840,864
500	Ekiti	887	13.0%	93%	3,270,798
е Е	Abia	1,015	32.3%	82%	3,727,347
JE	Ebonyi	925	12.1%	39%	2,880,383
SS	Edo	1,267	11.8%	82%	4,235,595
	Plateau	1,254	13.9%	36%	4,200,442
NC	Cross River	1,004	4.9%	57%	3,866,269
	Kogi	820	19.4%	63%	4,473,490
NW	Kano	2,429	17.3%	52%	13,076,892
NE	Bauchi	661	19.7%	29%	6,537,314
	TOTAL	13,235	13.6%		

State by state comparison of SAS penetration, grid electricity and population estimates



TRADE CENSUS





State Summary Methodology & Consumer Penetration

DEEP DIVE



CONSUMER SEGMENT

	Households	MSME
Total	665	222
Оуо	97	19
Ekiti	64	34
Abia	47	20
Ebonyi	71	21
Edo	38	20
Plateau	73	21
Cross River	73	18
Kogi	90	26
Kano	65	23
Bauchi	47	20

Product / brand usage

Usage experience

User profiles







Contact us!



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