Funded by the European Union

Alliance for Rural Electrification

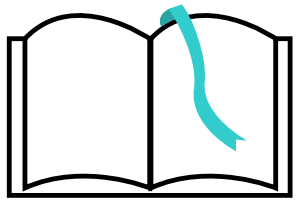
Catalysing decentralised renewable energy market development for sustainable electricity access in high opportunity countries through industry engagement and DRE Market & Impact Report

NIGERIAN COUNTRY BRIEFING – MAY 2024

THE EUROPEAN UNION GLOBAL TECHNICAL ASSISTANCE FACILITY FOR SUSTAINABLE ENERGY

Implemented by a consortium led by Stantec

INDEX



Funded by
the European Union

INDEX

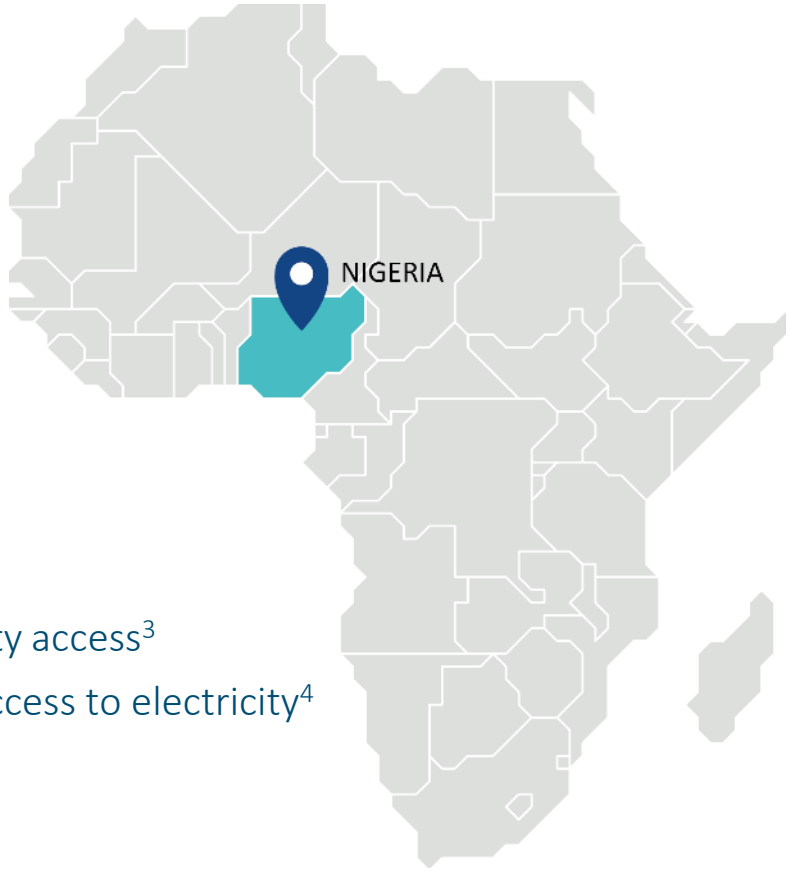
Funded by
the European Union

OVERVIEW OF ENERGY ACCESS STATUS

59.5% Electricity access rate[1,4]

89.2% Electricity access rate (urban)[1]

26.3% Electricity access rate (rural)[1]



218 Population (total in millions)[2]

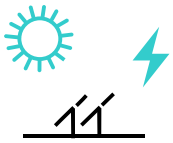
2040 Target year for universal electricity access[3]

88.5 Population (in millions) without access to electricity[4]

1. World Bank (2021). Open Data
2. World Bank (2021). Open Data
3. Rural Electrification Strategy and Implementation Plan (RESIP) (2016)
4. IEA, IRENA, UNSD, World Bank, WHO (2022). Tracking SDG 7: The Energy Progress Report. 2020 statistics

Funded by the European Union

OVERVIEW OF ENERGY ACCESS STATUS



2,284,000
Number of live stand-alone solutions[1]

113
Number of operational mini-grids[2]

10% mini-grid & 5% stand-alone
Targeted electricity access per solution type[6]

17%
Clean-cooking access rate[3]

181M
Population without access to clean-cooking[4]

2030
80% target access to clean-cooking[5]

1. GOGLA (2022). Off-Grid Solar Market Trends Report 2022: State of the Sector (2019-2022)
2. Nigeria Sustainable Energy for All (SEforALL) Tool (2022)
3. World Bank (2021). Open Data
4. Nigeria Energy Transition Plan (2022)
5. Nigeria Sustainable Energy for All (SEforALL) Action Agenda (2016)
6. National Renewable Energy Action Plans (2016)

Funded by the European Union

TYPES OF SCHEMES USED FOR MINI-GRIDS

Funding	Scheme	EPC[1] & O&M[2]	Ownership	Description
PUBLIC	Government budget allocations	Government financed, construction & operation by shortlisted mini-grid developers	Government	Funded through government annual budgetary allocations for electrification projects. Federal (through the Rural Electrification Fund under the Rural Electrification Agency (REA)) and state governments announce calls for proposals, and successful operator/bidders implement projects.
PRIVATE	Private sector funded	Private sector financed, construction & operation by shortlisted mini-grid developers	Private	Financed by private organisations such as donors, non-governmental organisations (NGOs), and development finance institutions (DFIs), typically as pilot projects or community social projects.

Funding	PPP[3] scheme	EPC[1] & O&M[2]	Ownership	Description
PRIVATE-PUBLIC	Build – Own - Operate	Donor/DFI funded through grants and technical assistance, construction & operation by shortlisted mini-grid developers	Government	Donor/DFI provides technical assistance in form of equipment and technical know-how, as well as grant funding to the government through eligible mini-grid operators who construct and operate the mini-grid. The government typically provides support through land provision and tax incentives. Examples include EU and German funded EU-BMZ (Nigeria Energy Support Programme-NESP, implemented by GIZ.
PRIVATE-PUBLIC	Build – Own - Operate	Funded through a mix of government grant subsidies and private sector investment, construction & operation by qualified mini-grid developers	Private	Government initiatives such as the Nigeria Electrification Project (NEP) funded through the World Bank and Africa Development Bank, and the Solar Power Naija (SPN) Programme funded through the Central Bank of Nigeria, through performance-based grants and minimum subsidy tenders. A blend of government grant subsidies and private sector investment from eligible mini-grid developers.

Funded by the European Union

1. EPC: Engineering, Procurement and Construction
2. O&M: Operations and Maintenance
3. PPP: Public-Private Partnership

TYPES OF BUSINESS MODELS USED FOR STAND-ALONE SYSTEMS

Financing

Consumer finance consists of upfront sales and credit. Credit sales can be either short-term credit payments (typically three months), lease-to-own, or perpetual lease models.

Payments are predominantly cash and PAYGO based. Appliances are typically sold as part of solar home system kits and form part of PAYGO system payments as well.

Cash sales of lighting products between 2019 – 2021: 659,000.[1]

PAYGO sales of lighting products between 2019 – 2021: 574,000.[1]

Ownership

1. Consumer owns assets immediately in the case of upfront sale.
2. Consumer owns assets upon completion of credit payment in the case of short-term lease and lease-to-own models.
3. Stand-alone system company owns asset in the case of perpetual lease where the ownership remains at the company level. Consumer pays for the service provided.

O&M & CM[2]

1. Consumer is educated on O&M.
2. Stand-alone system company provides technical and warranty support for an agreed period of time.

Description

Product payments in Nigeria are predominantly cash-based, with consumers taking full ownership of the product. Whether small petrol gensets, kerosene lamps, Solar as Service (SAS) products or other fast-moving consumer goods (FMCGs), consumers typically buy to own. Factors such as the absence of mobile money and little or no credit markets make a major contribution to this.

However, the introduction of the PAYGO model has increasingly been adopted by consumers due to the benefit of increasing affordability by spreading out payments over longer periods (over a year) than cash credit (typically 3-6 months). However, this is largely based on a lease-to-own model where the consumer owns the product eventually, rather than a perpetual lease model. While the market is predominantly cash based, the PAYGO model has increased significantly over the years and is almost at par with cash sales, based on GOGLA reports.[1]

Funded by the European Union

1. Lighting Global/ESMAP, International Finance Corporation, Efficiency For Access Coalition, GOGLA, Open Capital Advisors (2022). Off-Grid Solar Market Trends Report 2022: State of the Sector
2. O&M & CM: Operation and Maintenance and Client Management

EVOLUTION OF THE MINI-GRID MARKET

Number of operational mini-grids per type of scheme

ANALYSIS

Number of mini-grids by registered programme:

- 67 NEP
- 28 REA Fund & Projects
- 3 Federal Ministry of Power Projects
- 7 EU-BMZ (Nigeria Energy Support Programme-NESP).
- 1 United States African Development Foundation (USADF)
- 7 Infracredit Clean Energy Funding Programme (CEFP).

Evolution of schemes over the last years

Over the past 10 years, the Nigerian mini-grid market has evolved from largely donor grant funded pilot and social projects with no commercial potential and interest to one largely private sector driven attracting commercial investment and deployment of commercially viable mini-grids utilising innovative business models. This has been largely facilitated through technical and non-technical support from donors and DFIs. Currently, the Nigerian mini-grid market is one of the fastest growing on the continent with an estimated market potential estimated of over $8 billion annually.

Expected main schemes for the future

- The mini-grid sector has evolved from solely philanthropic and pilot schemes to the current PPP schemes largely driven through government initiatives, such as the Nigeria Electrification Project (NEP). The market continues to evolve towards becoming increasingly commercially viable with initiatives such as Productive Use of Electricity (PUE) schemes/models implemented to further improve rural economies and stimulate demand.
- Considering the size of the demand, market, and commercial interest, the mini-grid sector is further expected to evolve from PPP schemes to one with less grant percentage due to improvements in costs and revenues. The energy nexus approach will be key to this where mini-grids are further integrated into rural economic activities such as the agricultural value chain and not just seen as separate projects, but as components of a larger rural economic ecosystem.

Funded by the European Union

EVOLUTION OF THE STAND-ALONE SYSTEMS MARKET

ANALYSIS

Number of stand-alone systems per type of business model

According to GOGLA's annual sales data (Jul 2019 – Dec 2022)[1], stand-alone systems have been sold by:

- Cash sales of off-grid stand-alone solar individual systems – 931,000 units;
- PAYGO sales of off-grid stand-alone solar individual systems–1,333,000 units.

The REA also has 315,128 and 19,000 solar home systems (SHS) deployed through the NEP and Rural Electrification Fund (REF) initiatives utilising the Results-Based Finance (RBF) business model.[2]

In terms of capacity installed by 2021[(3)]:

- Solar Lights (<11W): 2,380 MW
- Solar Home Systems (11-50W): 3,746 MW
- Solar Home Systems (>50W): 20,447 MW

Evolution of business models over the last years

Over the past 10 years, the SAS market has evolved from grant-funded to a fully private sector led commercial market with an influx of global SHS companies and a large presence of indigenous SHS companies. Business models have also evolved from predominantly cash-based to the growth of PAYGO. Larger SAS companies in Nigeria are also adapting their market approaches through partnerships with Telecom Companies (Lumos in early 2020 reviewed its revenue-sharing model under their partnership with MTN), and the utilisation of mobile payment agents in rural communities for collection and as sales reps.

Expected main business models for the future

While both PAYGO and cash sales are growing, PAYGO and the utilisation of payment agents as alternatives to cash is expected to dominate over the coming years. It is also important to note the evolution of the power-as-a-service (PAAS) model for much larger SAS systems (typically over 1kW) like the perpetual lease model where the consumer only pays for the power consumed while the asset belongs to the SAS company.

1. Lighting Global/ESMAP, International Finance Corporation, Efficiency For Access Coalition, Open Capital Advisors (2022). Off-Grid Solar Market Trends Report 2022: State of the Sector
2. REA Sector Update Report (2022)
3. IRENA off-grid statistics (2021)

Funded by the European Union

EVOLUTION OF THE PRODUCTIVE USE OF ELECTRICITY (PUE) MARKET

ANALYSIS

PUEs – Typology and main uses

PUE is predominantly linked to agricultural activities and related to machinery used across the agricultural value chain for specific crops, as well as for rural small and medium-sized enterprises (SMEs). The most common PUE for agriculture are solar water pumps and solar-powered cold rooms for storage (predominantly stand-alone). For SMEs, these include predominantly solar refrigerators.

Industry sectors (agriculture, fisheries, telecom, mining, etc.)

Agriculture: Mainly for irrigation and storage. For processing, a USAID study on value chain activities for 12 crops shows highest potential for cassava grating, rice milling, and flour milling. [1]
Telecom: Mini-grid developers are exploring partnerships with telecom operators as anchor loads for their mini-grids.
SMEs: Most PUE SME activities include shilling (refrigerators), and powering rural businesses such as vulcanising, tailoring, barbing, etc.

E-cooking

The market for e-cooking in Nigeria is still at an infancy stage with no major player. Clean cooking is largely focused on liquefied petroleum gas (LPG) and clean cook stoves.

1. USAID (2020). Nigeria Power Sector Programme - Agricultural Productive Use Stimulation in Nigeria: Value Chain & Mini-grid Feasibility Study

Funded by the European Union

EVOLUTION OF THE MARKET FOR SOCIAL INFRASTRUCTURE

ANALYSIS

Number of systems per social use

- Health: 13,053 existing health units "off-grid"[1]
- Education: No available data source
- Water: No available data source
- Streetlight: No available data source

Evolution of business models over the last years

Deployment of solar solutions for social infrastructure has and is still predominantly government-led both at the national and sub-national level, as well as through donor initiatives:

1. **Government:** These are largely solar streetlights and solar-powered water boreholes. These form part of government annual budgets for social and rural projects both by the executive and legislative arms of government. The solar solution is 100% government funded.
2. **Donor:** Through the Traditional Equipment Ownership Model, a donor agency either directly provides grant funding and commissions an NGO or private sector actor, or grants a public agency funding to commission an NGO or private sector actor to design, purchase and install solar PV systems at a public institution (e.g., health facility). The asset is owned by the public institution or agency. This has been the predominant model for most health and education facility electrification. Donor initiatives such as the United Kingdom (UK) Solar Nigeria Programme (powered over 170 primarily health centres and schools through SAS), EU SEforALL Powering Healthcare initiative, USAID Power Africa, and the Heinrich Boll Foundation are making efforts to develop business models for SAS deployment for health facilities.

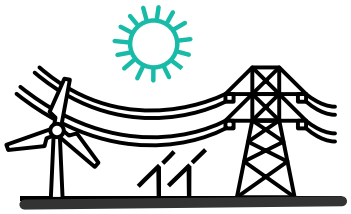
Expected main business models for the future

Efforts to develop business models for sustainably powering social infrastructure especially schools and primary health centres are being made mainly by donors, including EU, SEforALL, USAID Power Africa, the World Bank, and the Heinrich Boll Foundation. The government - through the Rural Electrification Agency's Energizing Education Initiative - is exploring the development of a private sector led model of power academic institutions and health facilities. However, it is expected to still be largely government funded in the nearest future.

Funded by the European Union

1. https://africa-knowledge-platform.ec.europa.eu/energy_tool#!

INDEX



Funded by
the European Union

PRIVATE SECTOR: AN OVERVIEW OF PRIVATE COMPANIES

Off-grid standalone solar

Over the past 10 years, the Stand-Alone Systems (SAS) sector has developed from a largely grant funded market to a fully private sector led and commercially viable market with an influx of foreign and local SAS companies. Business models have also developed from a predominantly cash based model to the adoption and growth of PAYGO.

Large SAS companies in Nigeria have adapted their market approaches through partnerships with stakeholders such as telecom companies, and the utilisation of mobile payment agent companies in rural communities for collection and as sales representatives.

PAYGO is based on a lease-to-own model where the consumer owns the product eventually, rather than a perpetual lease model. While the market is predominantly cash based, the PAYGO model has increased significantly over the years and is almost on par with cash sales.

Mini-grids

The Nigerian mini-grid sector is nascent but fast growing, with most operators established in the past five to eight years. There has been a lot of interest in the sector, which has grown significantly from just 11 mini-grids (mainly pilot demonstration projects) and ~5 mini-grid developers in 2015 to ~113 mini-grids with a total installed capacity of ~12MW and 171,635 connections across 135 communities.

Nowadays, about more than ~115 mini-grid developers are active in the mini-grid market. This growth has been encouraged by the development of the Nigerian Mini-Grid Regulation (from 2016 and updated in 2023) which provides the regulatory framework for investment and deployment of mini-grids in the country, and by the Nigeria Electrification Project (NEP) which has catalysed commercial investment in mini-grids across the country.

It is important to note that most of the progress and investment in the mini-grid sector is related to off-grid mini-grids. However, there is an increasing interest in the deployment of interconnected mini-grids for grid connected and unserved/underserved areas.

1. GOGLA, 2022 2nd Semester Sales Report (2023)

Funded by the European Union

SUPPLY SIDE – CURRENT SUPPORTIVE PROGRAMMES

DFI/Donor	Initiative	Scope	Amount	Implementation timeline
1. EU/BMZ/GIZ	1. Nigeria Energy Support Programme (NESP) – Phase 2	1. Technical assistance programme focused on: Planning, data, regulatory framework and capacity building.	1. €48 million	1. 2017–2023
2. UK	2. Africa Clean Energy Technical Assistance Facility	2. Technical assistance to government and private sector to catalyse a market-based approach for private sector delivery of quality stand-alone solar systems	2. £15.5 million	2. 2018–2022
3. UK	3. Nigeria Infrastructure Advisory Facility (NIAF)	3. Scope covers infrastructure (power, roads, infrastructure finance). Technical assistance delivered on a mutual accountability basis to support transition to a sustainable market solution including sustainable mini-grids.	3. £72.8 million	3. 2019–2023
4. AFD	4. Sustainable Use of Natural Resources and Energy Finance	4. The scope covers technical assistance and credit line.	4. €70 million	4. 2020–2023
5. EU/EDFI	5. The Electrification Financing Initiative	5. Impact investment facility and financing.	5. €275 million	5. 2015–2030

Funded by the European Union

SUPPLY SIDE – CURRENT SUPPORTIVE PROGRAMMES

DFI/Donor	Initiative	Scope	Amount	Implementation timeline
4. USAID Power Africa 5. Shell Foundation 6. Global Environment Facility (GEF)/ the UN Development Programme (UNDP)	4. Nigeria Power Sector Programme (NPSP) 5. Nigeria Off-Grid Market Accelerator Programme (NOMAP) 6. De-risking Sustainable Off-Grid Lighting Solutions in Nigeria	4. Areas of support: • sector assessment • support to REA • support to the private sector (transaction advisory) • donor coordination activities 5. Market accelerator that aims to address market barriers limiting energy access in Nigeria. Covers mini-grids and SAS. 6. De-risk private sector investments in the market for rural decentralised renewable energy access, primarily solar lanterns and solar home systems: • policy support • access to finance • market and demand assessments.	4. $109.2 million 5. NA 6. $4.33 grant; $10.6 co-financing	4. 2018–2023 5. NA 6. 2022–2027

Funded by the European Union

SUPPLY SIDE – CURRENT SUPPORTIVE PROGRAMMES

DFI/Donor	Initiative	Scope	Amount	Implementation timeline
7. Rockefeller Foundation (under Global Energy Alliance for People and Planet - GEAPP) 8. World Bank, Clean Technology Fund and Netherlands Cooperation (Directorate-General for International Cooperation-DGIS) 9. Global Environment Facility (GEF)/ the UN Development Programme (UNDP)	7. Energising Agriculture Programme 8. Regional Off-Grid Electricity Access project (ROGEAP) 9. Africa Mini-Grid Programme (AMP)	7. Stimulating productive use of mini-grid electricity in agriculture by enabling market-led deployment of appliances, validate commercially led business models. 8. Increase access to sustainable energy within the 15 ECOWAS member countries and four other African countries using stand-alone solar products based on a harmonized regional approach: • enabling environment • entrepreneurship • access to finance. 9. Supporting access to clean energy by increasing the financial viability and promoting scaled-up commercial investment in mini-grids in Nigeria; designed as a Child Project to implement the Energizing Agriculture Programme (EAP).	7. $5 million 8. $338 million 9. Grant amount: $5.91 million Project development capital grants: $3.10 million Co-financing: $96.5 million	7. 2022–2025 8. NA 9. 2022–2025

Funded by the European Union

OFF-GRID SUPPLY SIDE – PRIVATE SECTOR AND MARKET BARRIERS

ANALYSIS

Private sector

The private sector market for mini-grids and stand-alone solar is highly competitive due to its huge market potential, the largest in sub-Saharan Africa. The market is dominated by a large and increasing number of local indigenous players and a number of foreign actors; with private sector capital from DFIs, investors, specialised debt providers, commercial banks, strategic corporates, and crowdfunding platforms. The market is still largely incentivised by government especially for mini-grids.

Other players (NGOs, associations)

Industry Associations:

1. Renewable Energy & Energy Efficiency Association (Alliance) (REEEA-A) - Alliance of all key renewable energy related associations in Nigeria supported by GIZ NESP;
2. Renewable Energy Association of Nigeria (REAN) – Primary industry association comprised of private sector renewable energy companies recognised by donor stakeholders supported by Heinrich Boell Stiftung, All On, Africa Clean Energy Technical Assistance Facility (ACE TAF), and GOGLA;
3. Others include the Sustainable Energy Practitioners Association of Nigeria (SEPAN), Council for Renewable Energy (CREN), and RAESON (Renewable & Alternative Energy Society of Nigeria).

NGO:

1. Heinrich Boell Stiftung, which has played a key role in research and data provision in catalysing the off-grid sector, and private sector support.

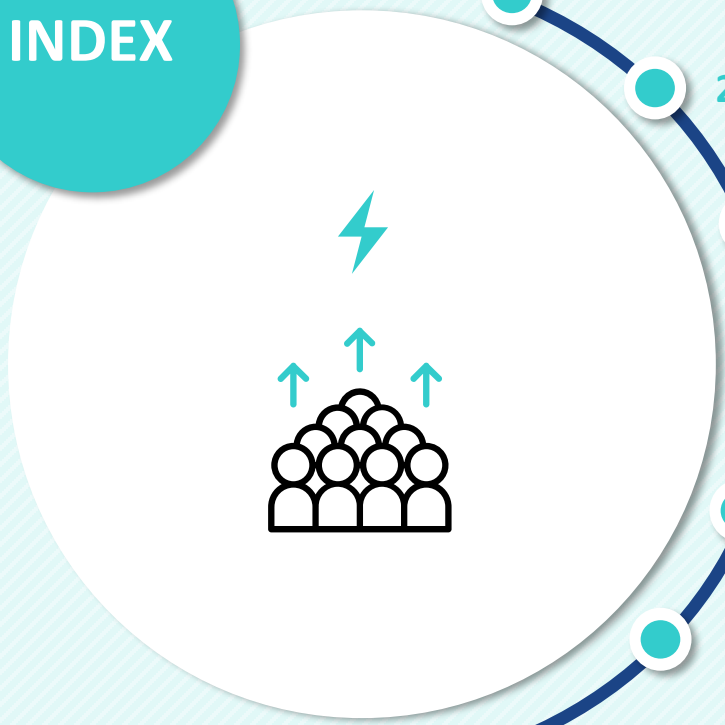
Market barriers on the supply side

Key Supply Side Market Barriers include:

1. Complex and ambiguous importation process
2. High presence and influx of poor-quality solar products
3. Lack of credible and easily accessible market data and intelligence
4. Payment collection constraints due to the absence of mobile money tools
5. Availability of skilled human resources (both technical and finance)
6. Lack of market intelligence online or publicly, and it is difficult to get from the companies themselves who are very strict with sharing data
7. Lack of production of components at country level
8. Need to strengthen the capacities of the industry associations

Funded by the European Union

INDEX



Funded by
the European Union

DEMAND SIDE – OVERVIEW OF MINI-GRIDS MARKET

	ANALYSIS
Total addressable market[2]	Currently, 88.5 million Nigerians lack access to electricity. The government plans for 15.4 million of rural population to be served by a mix of mini-grids and SHS by 2030.
Market potential per tier and ability to pay (cash/credit)	The market potential per tier for rural mini-grids in Nigeria are predominantly tier 2 and tier 3 customers who make up the larger portion of rural consumers with the ability to pay for mini-grids. According to an analysis by the SEforAll Africa Hub[1], 13.6 million Nigerians (13% of the non-electrified population) will currently be best served through mini-grids based on tiers 2 and 3 markets. A report by the REA estimates this as high as 15.3 million.[2] This number decreases as grid extension projects expand into current potential mini-grid markets over the years.
Market barriers	1. Affordability and ability-to-pay constraints. 2. Limited access to consumer finance, including for PUE. 3. Country macro-economic challenges – inflation and declining consumer purchasing power. 4. Low consumer awareness. 5. High import tariff on products increasing product price up to 40%. 6. Poor association to other potential consumer sectors (i.e. agro).
Estimated finance needs	According to the REA, $3.6 billion is required annually for investment in the Nigerian mini-grid market.[3]

1. SEforAll Africa Hub (2018). Mini-Grid Market Opportunity Assessment - Nigeria
2. Opportunities in the Off-Grid Sector in Nigeria (2019)
3. REA (2017). Nigeria Mini-Grid Investment Brief

Funded by the European Union

DEMAND SIDE – OVERVIEW OF STAND ALONE-SYSTEMS MARKET

ANALYSIS

Total addressable market

Currently, 88.5 million Nigerians lack access to electricity.[3] The government plans for 15.4 million of rural population to be served by a mix of mini-grids and SHS by 2030.

Market potential

According to an analysis by the SEforAll Africa Hub, 6.2 million Nigerians (6% of the non-electrified population) are best served by solar home systems (SHS).[1] A 2020 analysis by BCG[2] breaks it down further on a household level based on ability-to-pay. The analysis estimates that out of ~17.4M households without electricity access, ~1M could afford monthly SHS PAYGO with no incremental spend on lighting, ~2.2M could afford monthly SHS PAYGO with ~10% incremental spend from non-food budget, and ~14.2M likely cannot afford monthly SHS PAYGO under any scenario.

Market barriers

1. Limited access to consumer finance, including for PUE.
2. High presence and influx of poor quality products affecting consumer confidence in SAS products.
3. Country macro-economic challenges – inflation and declining consumer purchasing power.
4. Low consumer awareness and understanding of SAS products.
5. Affordability and ability-to-pay constraints.
6. Poor association to other potential consumer sectors (i.e. agro).

Estimated finance needs

There is a $2 billion potential annual market opportunity for SHS in Nigeria. According to an Africa Clean Energy Technical Assistance Facility (ACE TAF) report [2]

1. SEforAll Africa Hub (2018). Mini-Grid Market Opportunity Assessment – Nigeria
2. BCG (2020). Socio-Economic Case for Deepening Solar PV Deployment in Nigeria
3. ACE TAF (2021). Stand-Alone Solar Investment Map – Nigeria
4. REA (2017). Nigeria Mini-Grid Investment Brief

Funded by the European Union

INDEX

Funded by
the European Union

KEY PUBLIC INSTITUTIONS INVOLVED IN ENERGY ACCESS

	ANALYSIS
FEDERAL MINISTRY OF POWER	The Federal Ministry of Power is the policy-making arm of the Federal Government with the responsibility for the provision of power in the country. The Ministry - in discharging this mandate - is guided by the provisions of the National Electric Power Policy (NEPP) of 2001, the Electric Power Sector Reform (EPSR) Act of 2005, and the Roadmap for Power Sector Reform of August 2010.
RURAL ELECTRIFICATION AGENCY (REA)	The Nigerian Rural Electrification Agency (REA) is the implementing agency of the Federal Government of Nigeria under the Federal Ministry of Power tasked with electrification of rural and unserved communities. REA is the focal government institution for off-grid electrification in Nigeria.
NIGERIAN ELECTRICITY REGULATORY COMMISSION (NERC)	The Nigerian Electricity Regulatory Commission (NERC) is an independent body, established by the Electric Power Sector Reform Act of 2005 to undertake technical and economic regulation of the Nigerian Electricity Supply Industry.
ENERGY COMMISSION OF NIGERIA (ECN)	The Energy Commission of Nigeria (ECN) was established by Act No. 62 of 1979, as amended by Act No. 32 of 1988 and Act No. 19 of 1989 , with the statutory mandate for the strategic planning and co-ordination of national policies in the field of Energy in all its ramifications.
STATE MINISTRIES, DEPARTMENTS AND AGENCIES OF POWER	State governments have different institutions empowered with the mandate and responsibility for supervising and executing electrification projects for energy access. Most of the time, energy access are integrated into the State Ministries of Energy, Works and Housing, or/and Infrastructure.
BARRIERS	Limited understanding of off-grid business and project's implementation capacities of the public institutions.

Funded by the European Union

REGULATORY FRAMEWORK – ENERGY POLICY

PRE-CONDITIONS: ENERGY POLICY

1. A clear vision for the investment, management and operation of mini-grids and stand-alone systems in towns and villages (rural and peri-urban areas).
2. For isolated mini-grids, a legal and regulatory framework setting pricing principles and a pricing methodology reflecting real costs and allowing an acceptable return for the investor.
3. A mechanism to support low-income consumers.
4. A clear and stable institutional framework.

GAPS

1. Clear vision and regulation outlined through the National Renewable Energy and Energy Efficiency Policy, National Renewable Energy Action Plan, Rural Electrification Strategy and Implementation Plan, and the National Mini-Grid Regulation.
2. There is no gap. The legal and regulatory framework for tariff pricing is clear and effective as established in the National Mini-Grid Regulation. The updated 2023 regulation included the provision for a portfolio of sites.
3. There is no mechanism for the provision of demand-side subsidies for low income households to afford clean energy access solutions.
4. Clear institutional framework but poor coordination between relevant government institutions with regards to policy implementation.

Legend

The policy and regulatory framework could be as follows:

Acceptable | To develop | To improve | To reform

Funded by the European Union

REGULATORY FRAMEWORK – ECONOMY, INVESTMENT AND TAX

PRE-CONDITIONS: ECONOMIC, TAX AND INVESTMENT POLICY

1. Regulations defining the economic conditions for connecting isolated mini-grids to the national grid. ●
2. Public financing and incentive mechanisms in place to facilitate the economic viability of investments for these business models. ●

GAPS

1. The National Mini-Grid Regulations clearly defines the economic conditions for connecting isolated mini-grids under Chapter V Section 19 Interconnection of the Distribution Licensee's Network to an Isolated Mini-Grid operated under a Permit and Re-integration of Interconnected Mini-Grid into a Distribution Licensee's Network. Still, some companies think it can be further improved.
2. Public financing and incentive mechanisms are clearly provided for in the National Renewable Energy and Energy Efficiency Policy – Sections 2.7 Renewable Energy Financing; 5.4 Renewable Energy and Energy Efficiency Incentives; and 5.7 Special Customs Clearance of Renewable Energy and Energy Efficiency Equipment. These are further described in the National Renewable Energy Action Plan and Rural Electrification Strategy and Implementation Plan. Public financing mechanisms - such as through the Nigeria Electrification Project (NEP) and the Solar Power Naija Programme (SPN) - have also been set up and funded by the government up to $550 million and NGN 250 billion respectively. However, import duties are still applicable to solar components, ranging from 5–25%. VAT exemptions for select solar components are as provided in the 2021 VAT Exemption Order.

Legend

The policy and regulatory framework could be as follows:

● Acceptable ● To develop ● To improve ● To reform

Funded by the European Union

REGULATORY FRAMEWORK – ENVIRONMENT AND CONSUMER PROTECTION

PRE-CONDITIONS: ENVIRONMENTAL AND CONSUMERS POLICY

1. Regulations with minimum technical rules, including connection of isolated mini-grids to the national grid and certification of installers
2. Regulation on consumers protection, credit requirements for end users and waste management

GAPS

1. Chapter IV of the National Mini-Grid Regulations clearly defines minimum technical rules and certification requirements for installers. The Nigerian Electricity Regulatory Commission (NERC) has also developed and approved standards, manuals and codes that are binding on all Nigerian electricity services. The updated regulation of 2023 establishes the case for interconnected mini grids.
2. Regulations for consumer protection primarily focus on e-waste and quality standards. Whilst quality standards for SAS have been developed and adopted and e-waste guidelines for SAS developed by National Environmental Standards and Regulations Enforcement Agency (NESREA) and Standards Organisation of Nigeria (SON) with support from the UK government through ACE TAF, gaps still exists with regards to enforcement. There are no regulatory credit requirements for end users. Regulations on service for mini-grids are covered under the National Mini-Grid Regulations, Chapter IV.

Legend

The policy and regulatory framework could be as follows:

Acceptable | To develop | To improve | To reform

Funded by the European Union

REGULATORY FRAMEWORK – LICENSING AND TRANSPARENCY

PRE-CONDITIONS: LICENSING AND PERMITTING

1. Simplified procedures for obtaining licenses-permits for the operation of isolated mini-grids as well as the allocation of land.
2. A clear definition of the scope of exclusivity.
3. A legal and regulatory framework defining the principles and mechanisms for the transparent granting of land permits.

GAPS

1. These procedures are clearly provided for and straightforward under Chapters III, Registration, Grant of Permit and Mandatory Conditions; IV Operation of the Mini-Grid; and V Commercial Arrangement of the National Mini-Grid Regulations.
2. A clear definition of the scope of exclusivity is provided in the National Mini-Grid Regulations, Chapter VI Section 21 titled 'Exclusivity Period and Site Reservation for Project Development Purposes'. It covers the right given by a community to grant exclusive rights up to 12 months, the right of the developer to request an extension of the exclusive period, and the right of the distribution licensee and the community to grant an exclusive right to develop an interconnected mini-grid project until commissioning.
3. There is no clear policy provision on permits for land allocation.

Legend

The policy and regulatory framework could be as follows:

Acceptable | To develop | To improve | To reform

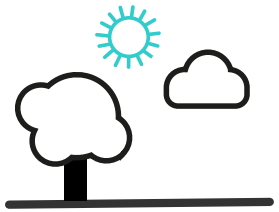
Funded by the European Union

POLICY & REGULATIONS – CURRENT SUPPORTIVE PROGRAMMES

DFI/Donor	Initiative	Scope	Amount	Implementation timeline
1. EU/BMZ/GIZ	1. Nigeria Energy Support Programme (NESP) – Phase 2	1. Technical assistance programme focused on planning, data, regulatory framework and capacity building.	1. €48 million	1. 2013–2023
2. UK	2. Africa Clean Energy Technical Assistance Facility	2. Technical assistance to government and private sector to catalyse a market-based approach for private sector delivery of quality stand-alone solar systems; primary focus on policy and regulatory reform.	2. £15.5 million	2. 2018–2022
3. World Bank, Clean Technology Fund and Netherlands Cooperation (DGIS)	3. Regional Off-Grid Electricity Access project (ROGEAP)	3. Increase access to sustainable electricity for households, businesses, government hospitals, schools within the 15 ECOWAS member countries and four other African countries using stand-alone solar products based on a harmonised regional approach.	3. $338.7 million	3. 2022–2025
4. GEF/UNDP	4. De-risking Sustainable Off-Grid Lighting Solutions in Nigeria	4. De-risk private sector investments in the market for rural decentralised renewable energy access, primarily solar lanterns and solar home systems: • policy support • access to finance • market and demand assessments	4. $4.33 grant; $10.6 co-financing	4. 2022–2027

Funded by the European Union

INDEX



Funded by
the European Union

EASE OF DOING BUSINESS – KEY SELECTED TOPICS

INDICATORS	COMMENTS
1. Time to create a company[1]	1. 7 days
2. Investment facilities for off-grid activities	2. Foreign investors such as Breakthrough Energy Ventures, Chapel Hill Denham; local investors such as All On, among others
3. Corruption Perception Index (CPI)[2]	3. 154/180
4. Labour Law	4. Present but limited in scope to employees engaged under a contract of manual labour or clerical work in private and public sector
5. Education institutions with focus on renewable energies	5. Primarily renewable energy training institutes including government institutes such as the National Power Training Institute of Nigeria (NAPTIN), and private institutes like Asteven Academy, Blue Camel
6. Taxation	6. Resident companies pay corporate income tax (CIT) on their worldwide income, non-residents are subject to CIT on Nigeria-source income. CIT is 0% for less than NGN 25 million turnover, 20% between NGN 25 million and NGN 100 million, and 30% greater than NGN 100 million. Others such as capital gains tax (10%) and personal income tax for employees exist. Companies can benefit from the Pioneer Status tax holiday – CIT relief for three years, extendable for one or two additional years.
7. Work permits for foreign employees	7. Online process; local documentation and support required from local company representative
8. Access to finance	8. Commercial finance from local banks come with high interest rate (over 25%). Current difficulty accessing Foreign Exchange (FX) at government rates and repatriating funds due to FX shortages in the country.
9. Language diversity[3]	9. There are over 250 ethnic groups. However, English is the national language.
10. Cultural diversity	10. High (250-300 ethnic groups)
11. Foreign investment policy	11. Primary laws which control foreign investments include the Nigerian Investment Promotion Commission Act of 1995 as amended and the Foreign Exchange (Monitoring and Miscellaneous Provisions) Act of 1995 as amended. Under the NIPC Act, foreign investors can own up to 100% equity in Nigerian subsidiaries, subject to the specific requirements of the relevant sectors.

Funded by the European Union

1. World Bank Doing Business Nigeria (2020)
2. Transparency International (2021)
3. LDI scoring. SIL International (2017)

DOING BUSINESS – GAPS AND BARRIERS

	ANALYSIS
 Market gaps	Lack of local financing. Financing challenges – high cost of raising capital especially from local financial institutions; depreciating value of the naira; foreign exchange accessibility barriers.
 Market barriers	1. Constraints and challenges in getting credible data 2. Difficulty in obtaining fiscal incentives 3. Lack of basic infrastructure and amenities such as road network inhibiting ability to access rural communities 4. Rising security risks in country 5. Limited number of skilled workforce in the sector
 Macro-economic situation	1. Currency devaluation 2. Rising inflation 3. Difficulty in accessing foreign exchange 4. Declining government revenue primarily due to international oil price volatility 5. Rising taxes and price of consumer goods 6. Declining consumer income

Funded by the European Union

INDEX

Funded by
the European Union

ACCESS TO FINANCE: OVERVIEW OF THE SECTOR

	ANALYSIS
 Commercial Finance Institutions (CFI): banks, microfinance	Commercial finance from local commercial banks is still limited, with high interest rates and collateral requirements. A few banks such as Sterling Bank are however progressive in financing the sector with technical assistance support from donors. Some microfinance banks such as LAPO, Grooming, are also providing consumer financing for solar products and partnering with SAS companies to retail products. Foreign investors such as Breakthrough Energy Ventures, Chapel Hill Denham and local investors such as All On - among others - are also key investors in the sector.
 Mobile money	PAYGO is largely used by an increasing number of SAS companies for payments. In the absence of mobile money solutions, companies still use payment agents to facilitate payment collection. The Central Bank recently launched Payment Service Banks as an alternative to mobile money, enabling Telecom companies to engage in rural financial service provision.
 Available blended finance instruments	Results-Based Finance (RBF), concessional debts, commercial debts, equity, crowdfunding, green bonds, specialised debt instruments, guarantees such as first-loss instruments. For example, Engie Energy Access project finance agreement to build a $60 million portfolio of mini-grids.
 Missing financing instruments and guarantees	There is an increasing need for more equity investment in the sector to enable companies scale, as well as construction finance at favourable rates. There is also a need for increased local currency financing and a hedging instrument to protect against FX risks, as most of the capital in the sector is from foreign financiers.
 Main barriers identified	• High interest rate and collateral requirements especially for local finance. • Financing instruments not designed according to market peculiarity and needs, i.e. long term patient low interest finance. • Forex constraints and currency devaluation inhibiting access to foreign capital. • Rising inflation and declining macro-economic situation in the country. • Rising inability of investors to repatriate funds due to shortage of foreign currency in the country resulting from declining government revenue.

Funded by the European Union

ACCESS TO FINANCE: CURRENT SUPPORTIVE INITIATIVES

DFI/Donor	Initiative	Scope	Amount	Implementation timeline
1. World Bank/ AfDB	1. Nigeria Electrification Project	1. NEP provides grant funding to support the deployment of mini-grids, SHS, and productive use appliances to communities.	1. $550 million combined ($350m from the World Bank, $200m from AfDB)	1. 2018–2023
2. AFD	2. Sustainable Use of Natural Resources and Energy Finance	2. SUNREF Nigeria seeks to improve access to energy through improved access to affordable finance for renewable energy and energy efficiency technologies to support various sectors such as industry and agriculture.	2. $70 million credit line; €9.5 million EU grant	2. NA
3. GEF/UNDP	3. De-risking Sustainable Off-Grid Lighting Solutions in Nigeria	3. It is designed to develop a private sector-led technology value chain for making solar lanterns and solar home systems available to base-of-pyramid rural households. It employs a novel approach to de-risk private sector investments in the market for rural decentralised renewable energy access.	3. $4.33 million grant; $10.6 million co-financing	3. 2022–2027
4. SEforALL	4. Universal Energy Facility	4. A Stand-Alone Solar for Productive Use (SSPU) programme that offers results-based grants to solar companies for verified end-user connections based on pre-determined standards.	4. $500 million	4. 2023 - 25

Funded by the European Union

ACCESS TO FINANCE: CURRENT SUPPORTIVE INITIATIVES

DFI/Donor	Initiative	Scope	Amount	Implementation timeline
1. Central Bank of Nigeria	1. Solar Power Naija	1. Federal government's concessional debt facility for the electrification of 5 million households in the country.	1. NGN 140 billion	1. 2020–2023
2. All On	2. NA	2. Provides access to commercial energy products and services for under-served and un-served off-grid energy markets in Nigeria, with a special focus on the Niger Delta.	2. NA	2. Continuous
3. Sterling Bank	3. NA	3. Provides commercial debt facilities for renewable energy projects in the country.	3. NGN 10 billion	3. Continuous
4. UKAID	4. De-Risking Facility	4. The UK is providing up to £10 million of concessional aid alongside InfraCredit to reduce the risk for pension and insurance funds to invest in energy access projects, and support Nigeria's COP26 commitments. The £10 million will be blended to de-risk transactions and therefore mobilise domestic institutional investment from local pension funds, insurance firms and other local institutional investors.	4. £10 million	4. NA

Funded by the European Union

ACCESS TO FINANCE: RESULTS-BASED FINANCE TENDERS (REA)

DFI/Donor

1. World Bank / AfDB
2. SEforALL

Initiative

1. Nigeria Electrification Project (NEP)
2. Universal Energy Facility (UEF)

Scope

1. Results Based Financing for mini-grids and solar home systems:

- Minimum Subsidy Tender (MST). A total of $ 25 million has been assigned for the MST to electrify 250 communities (WB);
- Minimum Subsidy Tender – will be implemented in two phases. The REA/NEP has prioritized 99 sites to be tendered in the first phase (AfDB);
- Performance-Based Grant. A total of $48 million has been assigned for the PBG programme. Grants of $ 600/connection, the naira equivalent of which will be disbursed to qualified mini-grid developers on a first-come first-serve basis, until the funds are exhausted. The total amount of grants to be provided are agreed upon based on the total numbers of connections for each site approved by the NEP;
- The Results Based Financing for Productive Appliances & Equipment aims to increase the productive use of energy in remote communities by increasing access to efficient, electric productive equipment. The component targets to electrify 24,500 MSMEs and 1,050,000 with improved access to energy services from productive use systems ($19M).

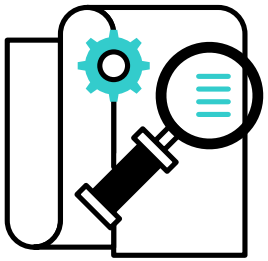
2. Results-Based Financing for stand-alone solar systems for productive uses. The UEF aspires to be a USD 500 million facility, delivering approximately 1.3 million electricity connections and 300,000 clean cooking solutions, while reducing 4.8 MtCO2e of carbon emissions

Funded by the European Union

INDEX

Funded by
the European Union

ANNEXES



Funded by
the European Union

OVERVIEW OF KEY ENERGY ACCESS POLICIES & REGULATIONS

Energy & Regulatory Policy

- Energy Power Sector Reform Act, 2005
- Rural Electrification Policy, 2006
- Renewable Energy Masterplan, 2012
- National Renewable Energy and Energy Efficiency Policy, 2015
- Rural Electrification Strategy and Implementation Plan, 2016
- National Renewable Energy Action Plan, 2016
- National Energy Efficiency Action Plan, 2016
- Sustainable Energy for All Action Agenda, 2016

Economic, Tax and Investment Policy

- Nigeria Investment Promotion Commission Act
- National Policy on Public-Private Partnerships
- Nigerian Investment Promotion Act
- Pioneer Status Incentive established by the Industrial Development (Income Tax Relief) Act, No 22 of 1971
- National Tax Policy, 2017
- Companies and Allied Matters Act, 2020
- VAT Modification Order, 2021

Environmental and Consumer Protection Policy

- Environmental Impact Assessment Act 2004
- Consumer Protection Act 2002
- National Environmental (Electrical/ Electronic Sector) Regulations SI No 23 of 2011 (updated 2021)
- National Mandatory Quality Standards IEC TS 62257-9-5:2018 (updated 2021) for SAS products up to 350Wp
- National Policy on Environment, 2016

Licensing and Permitting Policy and Procedures

- Regulation for Mini-Grids, 2016
- Used Electrical and Electronic Equipment (UEEE) Permit
- Environmental Impact Assessment (EIA) Permit

Funded by the European Union