IMPROVING THE ENABLING ENVIRONMENT FOR OFF-GRID SOLAR IN NIGERIAN STATES

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12 Usuma Street, Maitama,
Abuja, Nigeria.

Prosperity House, Westlands Road,
P.O. Box 19084 – 00100, Nairobi, Kenya.
Tel: +254 (0)20 271 0485

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ABBREVIATIONS

Acronym	Definition
ACE TAF	Africa Clean Energy Technical Assistance Facility
AfDB	African Development Bank
EKIIP	Ekiti State Integrated Infrastructure Project
EPSRA	Electric Power Sector Reform Act, 2005
ESEB	Ekiti State Electricity Board
FCDO	Federal Commonwealth and Development Office
FMoP	Federal Ministry of Power
GESI	Gender Equality and Social Inclusion
KAPSCO	Kaduna State Power Supply Company
MDAs	Ministries, Departments and Agencies
MoEMR	Ministry of Energy and Mineral Resources
NCDC	Nigeria Centre for Disease Control
NEP	Nigeria Electrification Project
NERC	Nigerian Electricity Regulatory Commission
NREEEP	National Renewable Energy and Energy Efficiency Policy, 2015
OGS	Off-Grid Solar
REA	Rural Electrification Agency
RFI	Requests for Information
SAS	Stand-Alone Solar
SHS	Solar Home Systems

EXECUTIVE SUMMARY

Nigeria has a huge energy access gap, with 77 million unelectrified people in 2020, the largest number in sub-Saharan Africa and second largest globally after India. The Federal Government has taken steps to improve electricity access including privatising the grid, however this has not resulted in any significant improvement in electrification.

Over the past six years, the government has increasingly recognised and utilised off-grid solar (OGS) solutions as a cleaner, faster and cost-effective means of bridging the electrification gap, including developing policy and strategy documents that include OGS electrification and implementing related projects. However, most of its OGS initiatives, such as the Nigeria Electrification Project (NEP) and Solar Power Naija Programme, are implemented at federal level, including most of the support it receives from donor programmes, market development organisations and multilateral development finance institutions. State governments are yet to fully recognise and utilise OGS in driving energy access to their unelectrified populations. OGS providers also face several challenges working with state government institutions in delivering OGS electrification projects.

This report assesses the enabling environment for OGS at the state level, highlighting barriers and providing recommendations to improve delivery in the states. Findings show that though the constitution of the country empowers federal and state governments to legislate on electricity, most states are yet to develop strategies for electrifying their off-grid communities, relying mostly on federal government initiatives. Where state electrification projects are present, they are mostly grid focused, including renewable energy projects. Budgetary allocations are also low, with states allocating between 0–5 per cent of total budgets to OGS.

Key barriers to OGS development at the state level generally stem from a lack of state government institutional capacity on the same. This creates several bottlenecks for OGS developers, including difficulties and duplicities in obtaining regulatory approval from state government institutions, and multiple taxation. State governments also lack credible data on energy access or electrification in their jurisdictions, and other relevant data that can inform private sector investment decisions. This lack of data limits the capacity of the states to carry out proper energy access planning and where data is available, they are usually outdated. OGS providers also face more political risks and bureaucratic challenges at the state than at the federal level. Furthermore, rising insecurity across the country also poses increased risks for OGS providers as electrical installations and infrastructure have been targets of terrorist attacks. This creates increasing concern for OGS providers and investors on the safety of their assets, which are mostly deployed in last mile rural areas.

Several recommendations are made in this report towards addressing the barriers identified and empowering state governments to develop their OGS sectors. These include the development of a state OGS strategy, policy and/or action plan to guide public and private sector investment. The state governments should designate a focal government institution with core oversight on OGS with relevant stakeholder coordination, including federal government institutions, private sector and donor programmes. State governments will need to provide annual budgetary allocations for OGS electrification to catalyse private sector investment such as through public-private partnerships or guarantees for OGS projects. There is also need for proper energy access planning, which can be achieved through a geospatial platform and data collation framework. State governments can leverage already existing platforms and tools at the federal level in collaboration with federal ministries, departments and agencies (MDAs) such as REA.

Donor programmes, multilateral development finance institutions and market development organisations can also provide technical assistance to state governments in implementing these interventions and improving OGS electrification in the states. **ACE TAF will be providing technical assistance to four states to develop OGS policies and the capacity of relevant state government institutions.**

1. INTRODUCTION

This report provides an overview of the enabling environment for off-grid solar (OGS) at the state level in Nigeria. The objective is to understand the current OGS landscape in states, the policy and regulatory environment and barriers to private sector entry and investment, and proffer recommendations to improve the enabling environment to scale OGS delivery for rural electrification in the states.

This report was developed following a review and analysis of relevant policy, regulatory and strategy documents from secondary research and primary data obtained from the states. Engagements and discussions were conducted with high-level government officials in eight states across the six geo-political regions, regional offices of the Rural Electrification Agency (REA), and OGS developers with experience working with state governments. The report consists of four sections and appendices summarised below:

Section 1 provides the study background, describing Nigeria's energy access context, the Federal government's electrification plan and the study methodology.

Section 2 reviews the current environment for OGS at the state level, including an assessment of the policy and regulatory framework, economic and electrification plans, stakeholder mapping, budgetary allocation, ease of doing business, OGS projects and gender, equality and social inclusion (GESI).

Section 3 discusses barriers to OGS development in states, including institutional capacity, duplication of regulatory functions and multiple taxation, lack of data, poor OGS sector knowledge, public perception, political bottlenecks, low-income level, insecurity, ease of doing business and institutional inefficiency, and poor state of public infrastructure.

Section 4 recommends interventions to address OGS barriers in the states and improve the enabling environment. These include development of a state OGS policy, plan or strategy, identification of a focal OGS institution, capacity building, data and energy access planning, coordination, public-private partnership and investment facilitation, security and GESI. The section also recommends next steps for stakeholders in implementing the findings in this report.

The Appendices include an overview of the comparative analysis of the primary states, study methodology, legal, policy and regulatory framework in states, and electrification status.

2. CONTEXT AND METHODOLOGY

2.1 Context

Out of a population of over 201 million, 77 million Nigerians still lack access to electricity. Nationwide, this represents over 40 per cent of households, and about 60 per cent of these are in rural areas. Among those who do have connections, the majority are connected to an unreliable grid with frequent – and costly – outages.[1] Households often spend more on generator fuel and kerosene for lighting than on consumption from the grid, resulting in an inefficient, costly and environmentally damaging energy sector.

The Federal Government aims to achieve 100 per cent electrification by 2040 and has developed several energy access policies, plans and agenda that promote off-grid solar (OGS) electrification. The country is already one of the largest OGS markets globally, with an estimated investment opportunity of around USD9.2 billion per year.[2]

To achieve its energy access targets, Nigeria will need to provide electricity to more than one million households per year and add roughly 25GW to its power generation capacity. This will require the government – both at the federal and state level – to utilise a range of solutions beyond grid extension. Nigeria's off-grid market is unique due to the enormous deficit of centrally generated power vis-a-vis actual demand. The increase in installed capacity and generation in recent years falls far short of the growth in the population's demand for power.

Nigeria's energy priorities include expanding clean energy access to rural communities not connected to the national grid through the development of solar mini-grids and distribution of stand-alone solar (SAS) systems. It also supports the roll out of OGS solutions for urban centres with unreliable grid power to electrify schools, hospitals, households and commercial facilities. Initiatives such as the Nigeria Electrification Project (NEP), a USD550 million programme co-funded by the World Bank and the African Development Bank and administered by the Federal Rural Electrification Agency (REA); the Solar Power Naija Programme funded by the Central Bank to connect five million households to solar; and REA's Rural Electrification Fund (REF), all aim to leverage private sector investments to deploy solar mini-grids and solar home systems (SHS) across the country.

Although most OGS initiatives, programmes and projects are led at the federal level, state governments have a significant, though largely overlooked, role in energy delivery to off-grid rural communities. State governments are constitutionally empowered (under the amended 1999 Constitution) to provide electricity by establishing electric power stations, and generating and distributing electricity to rural areas not covered by the national grid within their states.[3] They thus have the mandate and responsibility to develop plans and initiatives to improve off-grid electricity delivery in rural areas. Clean energy resources such as OGS present opportunities for the states to electrify off-grid rural areas while leveraging OGS initiatives at the federal level.

In addition, state governments have climate mitigation and adaption responsibilities to transition to cleaner energy sources in support of the national climate targets. OGS provides triple benefits: (i) meeting state electrification needs; (ii) supporting national climate targets; and (iii) driving sustainable socio-economic empowerment. There is internationally validated empirical evidence and literature on the importance of access to energy to drive improvement in socio economic living standards and economic activities.[4] Additionally, a supportive enabling environment is key to the development of the OGS market and attracting private investment to meet electrification targets.

State governments, however, have limited understanding, capacity, experience and technical support in utilising OGS for rural electrification, and focus mainly on grid extension projects. OGS providers also face more challenges engaging with state government institutions than the federal government. Some of these include difficulties obtaining relevant state regulatory approvals, multiple taxation, data unavailability and other bureaucratic hurdles. Therefore, scaling OGS delivery, which helps to meet the national electrification targets, will require the combined effort of all tiers of government. This report explores how the enabling environment in the states can be improved so that state governments are empowered and the OGS sector can scale.

1. *Energy and Economic Growth (2020). Moving beyond energy access: The challenge and impact of unreliable electricity in emerging economies.*
2. *ACE TAF (2021). Stand-alone solar investment map – Nigeria.*
3. *Item 14 of Part II, Schedule 2 to the 1999 Constitution of Nigeria.*
4. *GOGLA (2019). Off-Grid solar: A growth engine for jobs.*

2.2 Methodology

This study utilised primary (interviews with high-level state government stakeholders, REA regional offices, and OGS providers) and secondary (review of relevant federal and state government policies and regulations, energy access and sector documents, and data sets) data collection methods, in collaboration with REA.

As shown in Table 1, 12 states were identified – two states per geopolitical region – utilising a state selection analysis tool to get a comprehensive understanding of the market status and enabling environment for OGS. The identified states were categorised into primary and secondary states per region based on their scores on a selection criteria that considered state electrification, policy and regulatory framework, ease of doing business, gender and social inclusion, poverty rate and other indicators. Primary states were the focus of the state OGS assessment while secondary states were considered substitutes in the event that challenges were encountered with the primary states. In the end, engagements were held with eight states due to delayed response from four states.

For the desk research, relevant OGS documents at the federal and state level were reviewed, including legislation such as the Electric Power Sector Reform Act, 2004; policies such as the National Renewable Energy and Energy Efficiency Policy, 2015 and National Renewable Energy Action Plan, 2016; regulations such as the NERC Mini-Grid Regulations, 2016 and available state regulatory documents; state economic documents such as the Jigawa State Comprehensive Development Framework, Ekiti State Integrated Infrastructure Project, and others from the assessed states; state budgetary provisions, investment guides, private sector incentives, and socio-economic documents. State GESI documents were also reviewed such as the state gender policies, state social security law, and the GESI Action Plans of focal state government institutions. Information and primary data were provided by state governments and OGS providers implementing projects in the states.

Table 1: Primary and secondary states

No.	Regions	Primary States	Secondary States
1.	North-West	Jigawa	Kaduna
2.	North-East	Bauchi	Yobe
3.	North-Central	Plateau	Benue
4.	South-East	Ebonyi	Enugu
5.	South-South	Cross River	Edo
6.	South-West	Ekiti	Oyo

Note: States engaged are highlighted in orange

3. ENABLING ENVIRONMENT FOR OFF-GRID SOLAR IN STATES

This section discusses findings from the desk research and stakeholder interviews on the enabling environment for OGS in states. It reviews the existing policy and regulatory environment, economic and electrification plans, stakeholder mapping, ease of doing business, socio-political factors, and gender and social inclusion (GESI).

3.1 Energy policies and regulations

The legal framework for the Nigerian power sector is primarily governed by federal legislation. According to the 1999 Constitution of the Federal Republic of Nigeria,[5] the National Assembly may make laws for: (i) electricity and the establishment of electric power stations; and (ii) the generation and transmission of electricity in any part of the Federation and from one state to another state while a State House of Assembly may make same laws but for areas not covered by a national grid system within the state. Most states however have not taken full advantage of this constitutional provision to enact laws and policies that will promote access to electricity in off-grid areas.

While most state governments rely on federal legislation, some states have enacted state electricity legislation to guide electricity provision. Lagos and Ekiti state electricity legislations, for example, establish agencies tasked with electricity regulation and energy matters, and Imo state enacted a law establishing an independent state power agency in 2019. However, these legislations are almost entirely on-grid focused.

With regards to renewable energy, most states largely rely on federal policies such as the National Renewable Energy and Energy Efficiency Policy, 2015 (NREEEP). While most states have economic plans/agenda that include state electrification plans, many have not developed electricity policies, strategies or action plans that take cognisance of OGS solutions. Of all states considered, only Plateau, Kaduna, Oyo and Ekiti[6] states have electricity policy and strategy documents that recognise OGS. Plateau and Kaduna states, for example, have an Off-Grid Energy Policy and State Solar Street Light Policy, respectively. Other states recognise the need for such policies such as Lagos State which recently developed a State Electricity Policy, with support from the UK's Foreign, Commonwealth and Development Office (FCDO). It is important to note that most of the states with electrification strategies or projects that recognise OGS have received some level of donor support from such organisation as FCDO, United States Agency for International Development (USAID) and GIZ.

Most state government energy/electricity legislation, policies or strategy documents are not easily accessible or publicly available. This poses a challenge for potential investors, OGS developers and other relevant stakeholders looking to understand the state government plan for OGS. For non-energy sector policies and regulations that are relevant to the OGS sector, such as on quality standards and e-waste, state governments typically rely on federal legislation.

3.2 Ease of doing business

General barriers to ease of doing business in the states also apply to the OGS sector. They include multiple taxation, government bureaucracy, duplication of regulatory functions, political risk and lack of data/information. These barriers are discussed in more detail in Section 4.

Apart from company incorporation and registration, which is done at the federal level, companies must obtain certain requirements at the state level such as permits, licenses and other regulatory approvals. In many cases, these are in addition to those already obtained at the federal level. Obtaining these from the relevant state government institutions comes with bureaucratic delays, inefficiencies and other bottlenecks.

While all states surveyed have an agency or bureau for investment, state governments such as Jigawa and Kaduna have taken significant steps towards improving the ease of doing business generally, and specifically for OGS. Kaduna State, for example, established the Kaduna State Power Supply Company (KAPSCO) under the state's Ministry of Works and Infrastructure, which is charged with increasing electricity delivery to off-grid communities

5. *Item 13 of Part II, Schedule 2 to the 1999 Constitution of Nigeria (Concurrent List).*
6. *Under the Infrastructure and Governance Initiative of EKIIP, Ekiti state intends to develop an off-grid IPP of about USD14 million. The EKIIP also contains an all-encompassing Power Solution that includes transmission extension and distributed generation across the states*

(including OGS solutions), executing independent power projects, maintaining streetlights, and providing power to public buildings. KAPSCO facilitates OGS projects in the state, reducing bottlenecks and bureaucratic hurdles for OGS providers, and easing OGS deployment. The state also has one of the two fully equipped private sector solar assembly and training centres operated by Blue Camel Energy. The centre receives state government support for local assembly and deployment of solar streetlights in Kaduna and other states, and offers training on solar mini-grid and SHS installation.

The Jigawa state government, through its Investment Promotion Agency (InvestJigawa) acts as a one-stop shop for OGS developers in the state, facilitating private sector investment on solar projects in collaboration with other relevant government MDAs. The state government prioritises solar energy as a clean source of electrification, and investment opportunity due to the state's solar potential. The governor also has a Special Adviser on Solar, the first of such appointments in the country. The 2018 World Bank Doing Business in Nigeria Report for States[7] ranked Jigawa highly in its Ease of Doing Business ranking. It assessed states in Nigeria based on business indicators such as starting a business, registering property, dealing with construction permits and enforcing contracts, and is the latest of such reports by the World Bank on sub-national governments in Nigeria.

3.3 Economic plans and budgetary allocation

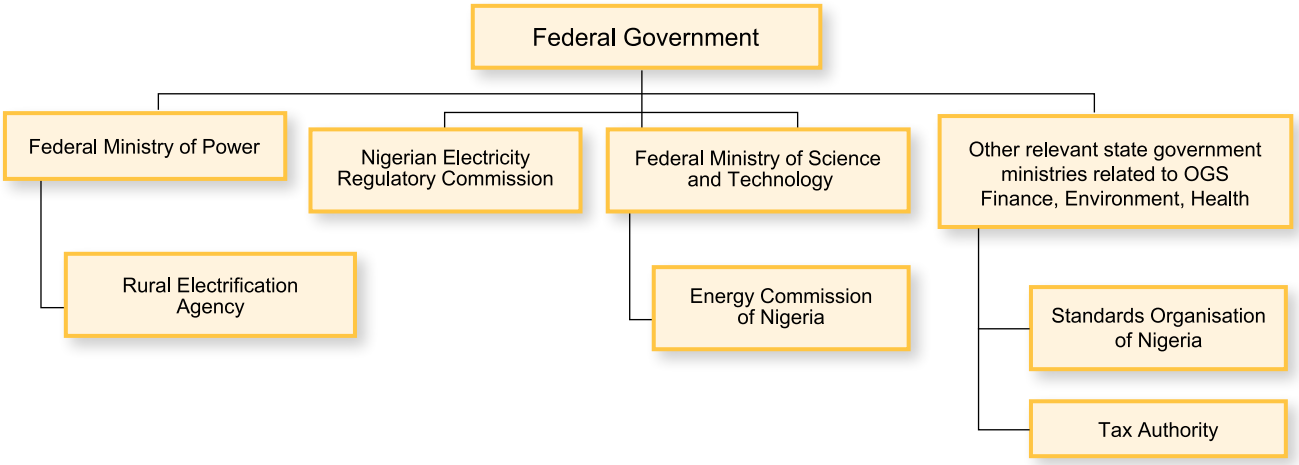
All state governments have economic development plans or strategies that are inclusive of proposed projects and targets for electrification. These generally consist of upgrading existing electricity infrastructure within the state, establishment of independent power projects, and commitments to increase rural grid connection. Some state plans, such as those in Plateau and Jigawa states, recognise and have targets for renewable energy electrification. The Plateau State 2019 Development Strategy, for example, aims to develop mini-grids by working with development banks for finance and donors for technical support and capacity building. The state plans to develop a rural electrification plan.

Most electrification plans or commitments in state economic documents are grid focused, with little recognition of OGS even though renewable energy is mentioned. For states that do recognise OGS, few have policies, strategies or action plans to support attainment of their proposed OGS goals. For most, OGS solutions are usually limited to solar street lighting and solar boreholes for social services.

In many cases, electrification plans do not translate to appropriate budgetary allocations, particularly for OGS. The 2021 budgets of states reviewed showed that most states have budgetary allocations for OGS projects under various MDAs in the range of 0–5 per cent of total budgets. As noted previously, this funding is limited to solar streetlights and solar boreholes, but not SAS, solar mini-grids or strengthening of MDAs charged with OGS responsibilities. With state governments slowly recognising the benefits of OGS electrification, there is need to allocate budgets for OGS to meet rural electrification goals and improve the enabling environment to attract private sector investment.

3.4 Stakeholder mapping

In the context of this report, stakeholder mapping means an analysis of the frameworks for electrification in the states that are specific to the development of OGS as shown in Figure 1. It identifies the relevant MDAs tasked with the responsibility of electrification and OGS, and their coordination based on information from the states.



7. *World Bank (2018). Doing Business in Nigeria.*

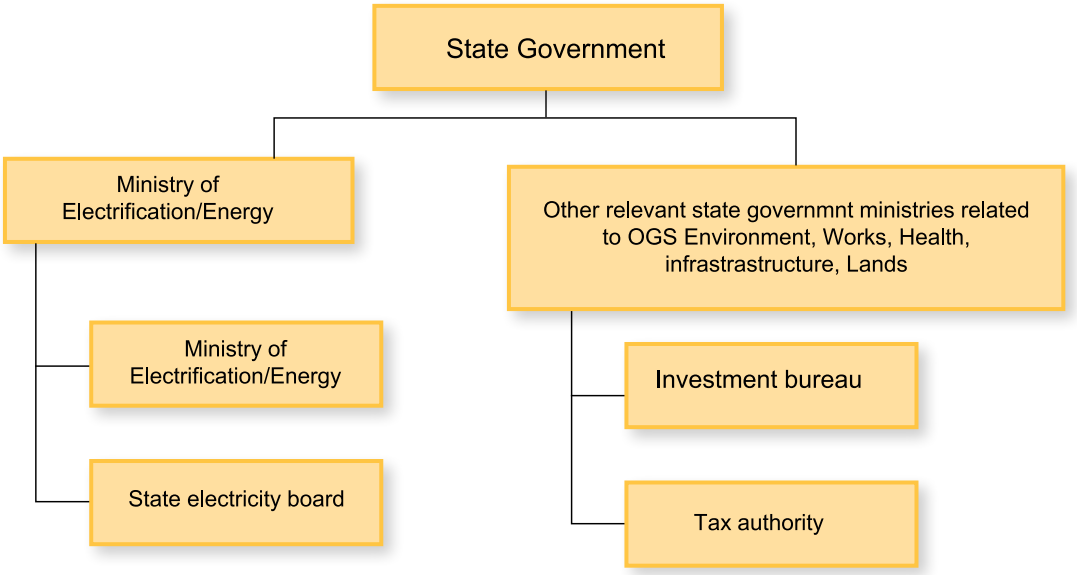


Figure 1: Institutional framework for OGS at the federal and state level

All states have either a ministry, agency or corporation charged with energy or electrification, which can either be the institution's sole mandate or part of a broader mandate. In the case of the latter, there is usually a separate agency set up on electrification. In some cases, this role may be duplicated in a separate government institution, especially in the case of OGS where multiple government institutions can undertake solar projects. For example, Lagos State has a Ministry of Energy and Mineral Resources (MoEMR) that has policy oversight on state electrification, and an electricity board mandated by the MoEMR for energy development, implementation of independent power projects, and public lighting. KAPSCO falls under the state's Ministry of Works and Infrastructure and is charged with increasing electricity delivery to off-grid communities including OGS solutions, executing independent power projects, maintaining streetlights and providing power to public buildings.

Jigawa State, on the other hand, implements OGS electrification projects under its Ministry for Environment, which is mandated to provide solar electricity to off-grid locations. Its Ministry of Works and Transport also has some responsibilities on OGS based on its mandate, with the State incorporating the Alternative Fund Energy Limited to coordinate the utilisation of energy sources such as solar. As previously noted, the state governor also has a Special Adviser on Solar Energy.

This delineation of functions across multiple state government institutions, or incorporation of electrification functions into broader mandates of single state government institutions is present across states, though more defined and coordinated in some than others.

All MDAs surveyed lacked sufficient knowledge about OGS and are primarily focusing on grid extension projects. We found that the capacity of these focal state government institutions is dependent on the level of external support provided by donor partners. For example, Lagos and Kaduna, which tend to have stronger institutional capacity for electrification and OGS, have received multiple donor support in terms of technical assistance and grant funded OGS projects.

3.5 Off-grid solar projects

OGS projects exist in all states surveyed and are predominantly solar street lighting (about 70 per cent) or solar borehole projects (about 15 per cent), with the remaining 15 per cent being projects such as roof-top solar installations for health centres, schools or public buildings and in a few cases solar mini-grids and SHS.[8] These are usually either funded by the state government or as part of constituency projects of the state's and federal lawmakers – lawmakers are allocated funds to implement community development projects in their states. Some

8. *See Item 9 in Appendix 1*

states are also beneficiaries of federal OGS projects such as the solar mini-grids and SHS deployed under REA, or donor funded projects. REA plays a major role in developing OGS projects across states through its OGS initiatives.

A few states such as Kaduna, Jigawa and Oyo have deployed state-funded mini-grid and SHS projects. Their sustainability, however, remains a challenge as some have been abandoned (such as in Kaduna). This is because they were delivered as "government contracts" with limited planning for sustainability once deployed. There are also large-scale solar projects planned in states, such as the Jigawa State Energy City Project, a large-scale grid connected solar project that includes interconnected mini-grids.

3.6 Gender and social inclusion (GESI)

Although, each state surveyed has a focal ministry for gender affairs, some states have broader gender policies or plans, with respect to the legal or policy framework. For example, Jigawa has a gender policy that focuses on GESI integration in the design and implementation of government policies and programmes. There are no GESI focused policies or plans specific to OGS or the energy sector in general in any of the states surveyed. However, some states such as Kaduna consider gender inclusion practices in their energy and OGS activities. Most state energy sector documents reviewed also had little or no recognition of GESI.

4. BARRIERS TO OFF-GRID SOLAR IMPLEMENTATION IN STATES

This section discusses key barriers and gaps in the enabling environment for OGS development at the state level following desk research and engagements with federal and state government stakeholders, as well as OGS providers.

4.1 Limited institutional capacity

Most states lack government institutional capacity on OGS, and where available, expertise is limited to grid connection and extension projects such as deployment of transformers to connect communities to the grid. Capacity required includes OGS knowledge and experience, technical and non-technical skills, coordination, and ability to implement state OGS plans. Even in states with energy, electricity or OGS policies, institutional capacity is still lacking or limited in implementing OGS projects. As a result of lack or limited OGS capacity, most states have been unable to put in place the required policy and regulatory framework to guide private sector investments in OGS.

Most state government institutions such as state ministries of works, environment and health have been involved in deploying OGS projects, however, with few exceptions, there is no focal government institution responsible for oversight and coordination of OGS electrification in states. Even in states where electricity boards exist, there are no desks or departments dedicated to OGS, and if so, their capacity is limited. As a result, OGS providers face challenges identifying relevant state government agencies to engage with on OGS projects and investments.

4.2 Duplication of regulatory functions and multiple taxation

OGS providers encounter duplications in obtaining regulatory approval from multiple state government institutions, and in some cases obtain from both state and federal government institutions. For example, in obtaining environmental licenses and permits, OGS providers have to deal with both the federal and state ministries of environment, as well as federal and state regulatory agencies. In situations where states have electricity regulatory boards, OGS developers must obtain permits from both the federal regulatory commission and state regulatory boards, leading to double taxation. While it is appreciated that federal and state governments have different tax mandates, it can be frustrating for OGS providers when differences occur between state government institutions.

Improved regulatory coordination is key to reducing the complexity and bottlenecks OGS providers face in states. In many cases, states adapt and implement already existing regulations at the federal level. However, some state regulatory bodies create different regulations, which can create confusion for OGS developers when attempting to conform with both the federal and state government requirements.

In addition, the issue of multiple taxes collected by the different tiers of government is compounded by the fact that, in many cases, it is backed by legislation. General tax and the tiers of governments to which they are payable to are outlined in the Taxes and Levies (Approved List for Collection) Act, 2004 as amended by the Schedule to Taxes and Levies (Approved List for Collection) Act (Amendment) Order, 2015 and includes those listed in Table 2. These taxes and levies are exclusive of the unofficial fees and levies imposed by host communities where projects are implemented. Refusal or failure to pay these unofficial fees and levies typically increases the risks of disruption to project operations.

OGS providers also reported incessant harassments from persons purporting to be agents of the state government, which impedes their operations. In most cases, the fees being demanded by these agents are not planned for by the OGS provider and are illegal.

Table 2: Taxes and levies collected by the federal, state and local governments in Nigeria

Federal Government	State Government	Local Government
• Companies Income Tax and Withholding Tax • Tertiary Education Tax • Value Added Tax • Stamp Duty • Capital Gains Tax (payable where any contracting party is a company)	• Personal Income Tax/Pay as You Earn and Withholding Tax • Stamp Duty • Capital Gains Tax (payable where both contracting parties are individuals) • Signage and Mobile Advertisement Permit (collected by states and local governments) • Land Use Charge • Business Premises Registration Fees • Economic Development Levy • Fire Service Charge • Social Service Contribution Levy • Infrastructure Maintenance Charge • Environmental (Ecological) Levy	• Radio and Television License Fees • Vehicle Radio License Fees • Public Convenience, Sewage and Refuse Disposal Fees • Signage and Mobile Advertisement Permit (collected by states and local governments) • Right of Occupancy Fees in rural areas

4.3 Lack of data

A major barrier to market development for private sector investment in states is the limited availability of credible data for investors and developers for planning and making investment decisions. Such data includes electrification rates in the state, detailed consumer demographics, and affordability indices. Where data is available, it is often not reliable as it is outdated, inaccessible, or not credible. In addition, data is often stored in silos and scattered across different government institutions, making it difficult for OGS providers to access. While no state was able to provide all data requested, data was generally more readily available in the northern states. Some state government institutions had issues accessing data domiciled in another state government institution due to coordination challenges.

4.4 Public perception and political bottlenecks

The business models of OGS providers are new to most consumers, and the average electricity consumer, particularly in rural areas, perceives electricity as a government social service and often does not pay for electricity. This poses a challenge for OGS providers who must first engage in consumer sensitisation before deploying OGS solutions to ensure they are paid for. OGS providers reported instances where consumers stopped paying for the electricity consumed after the first few months, which might be due to this perception or other reasons such as financial constraints.

As a result of this position, OGS providers tend to focus on communities with higher income, leaving last mile rural consumers unelectrified, unless subsidised by donors or the government. A first step for an OGS provider is to get commitments from the rural communities to minimise this risk and ensure project viability. In many cases, OGS providers, particularly SHS distributors, bypass government institutions and liaise with the community or rural government leaders to minimise state government bottlenecks.

Solar providers also reported cases where politicians use privately funded OGS projects to score political points. This changes the community's perception towards the OGS solution and their willingness to pay. In these situations, state governments and OGS providers need to sensitise communities to avoid such problems.

10. BCG (2020). Scale up of solar home systems in Nigeria.
11. The Cable (2021). Blackout in Maiduguri as Boko Haram destroys another electricity tower.

4.5 Leaving behind low-income households

Out of approximately 17.4 million households across the country without electricity access, about 14.2 million (81.6 per cent) are unable to afford electricity without any form of subsidy or financial support.[10] As such, most OGS providers target mainly peri-urban and near-rural areas where consumers have higher ability to pay, denying last mile consumers the crucial electricity services. Due to limited credible data at the state level, OGS providers and governments are also unable to identify these last-mile communities so as to design subsidised projects for them.

4.6 Insecurity

Rising insecurity – terrorism, banditry, kidnapping for ransom, herdsmen attacks, armed robberies and ethnic clashes, among others – in the country poses a major risk for OGS providers. In some cases, electrical installations and infrastructure are targets and vulnerable to attacks, though currently they primarily target grid infrastructure.[11] This insecurity impacts OGS deployment across all stages – from community engagements to operation, maintenance and after-sales service.

The result of this rising insecurity is that OGS providers now focus on areas within reasonable distance from the state capital. In states with high security risks, OGS providers incur additional costs providing security for their assets and employees, which increases their cost of doing business. In addition, OGS providers reported cases where rural consumers are unwilling to use SAS products as this may make them targets for robberies as they are deemed to be “affluent”, with some consumers returning already purchased PAYG SHS kits to the providers.

Some state governments acknowledged this challenge, noting that they are unable to guarantee the safety of OGS assets. It is possible that this could be due to these projects being implemented by the Federal Government with limited state government involvement, so state governments look to the Federal Government to protect the assets. Increased inclusion of state governments in OGS, as well as supporting state government design and deployment of government OGS projects could lead to better security measures as state governments (and communities) have a stake in them.

4.7 Ease of doing business and institutional inefficiency

Regulatory bottlenecks, complex processes, bureaucratic hurdles and delays, and other illegal processes encountered by OGS providers when dealing with state government institutions constrain the ease of doing business in states.

Lack of automation and digitisation of government processes in states significantly makes it difficult to set up and run businesses. Most state government institutions rely on manual processes that are slow, cumbersome and inefficient, delaying application processes for months, and even longer in cases of unforeseen situations such as the Covid-19 pandemic.

4.8 The poor state of social infrastructure

OGS providers focus more on areas that have basic public infrastructure like good roads, potable water and telecommunication facilities, so that they can enjoy economies of scale that ultimately reduce their cost of doing business. Inadequate or non-existent infrastructure means that OGS providers who wish to expand to those areas will have to incur costs to provide the infrastructure or adapt to the situation. For instance, OGS providers who operate in communities without access roads will incur higher costs to maintain their vehicles. These costs tend to discourage OGS investments, affect expansion plans and raise the retail price of OGS solutions as these expenses are passed on to consumers.

As a result, OGS providers typically focus on areas with reasonable infrastructure and therefore lower operational cost, thus limiting OGS delivery to last mile communities.

5. RECOMMENDATIONS

Based on the findings and analysis in the preceding sections of this report, the following are recommended interventions to improve the enabling environment for OGS delivery in states.

5.1 Develop state off-grid solar strategy

In line with their constitutional mandate for rural electrification, states need to develop OGS strategies, policies and action plans. These will provide guidance to the private sector as well as support the attainment of the states' electrification targets usually described in their economic plans.

Such OGS plans have to align with those of the Federal Government. State policies should outline the institutions responsible for OGS, incentives such as tax waivers, stakeholder and regulatory coordination, budgetary provisions, responsible practices, and GESI considerations. The policy should also identify capacity gaps and set out action plans for capacity building. Ultimately, other proposed interventions under this section can also form part of the state's policy document.

Donor programmes and OGS market development organisations can support state governments in the development of their OGS strategies, policies and action plans.

5.2 Establish focal off-grid solar institutions and capacity building

There is need to designate focal government institutions with primary responsibility for OGS electrification in the states. This could be achieved through state Rural Electrification Boards (REBs) under appropriate ministries in the states to coordinate with REA. At a minimum, these can be off-grid energy departments under the states' institutions responsible for electrification. This institution will be responsible for designing, developing, implementing, facilitating and overseeing OGS projects in the state, including those funded and implemented by the Federal Government. It will also coordinate with relevant federal and state government institutions and the private sector to reduce bureaucratic hurdles and challenges OGS providers face when engaging multiple government institutions.

Capacity building is also required for the focal state government institution on OGS, and other relevant state government institutions. A first step will be to carry out a needs assessment to evaluate the technical and non-technical skills gap, develop a capacity building plan, provide training and assess future capacity needs. Development and utilisation of online portals to process OGS applications can ease bureaucratic hurdles and facilitate inter-governmental coordination. Donor programmes and OGS market development organisations can support state governments on this.

5.3 Plan for data and energy access

Data is critical for both the government and private sector in planning and developing OGS projects. It is useful for investors seeking to identify market opportunities for OGS in the states. For the states, data provides information to enable them develop policies to improve rural energy access and catalyse private sector investment. Data should not just be available, but up-to-date, credible and accessible. State governments will require support in designing and carrying out data surveys and in utilising geospatial energy planning tools. REA can support state government focal OGS institutions through its Nigeria Energy Access Explorer Geospatial tool in energy access planning and aligning with Federal Government initiatives. This will also require coordination with relevant state and federal institutions such as the National Bureau of Statistics and MDAs in environment, agriculture, health and investment.

Donor programmes can provide technical assistance to state governments on this front. OGS providers can also share data and market information such as the number of households they are electrifying, with state governments to improve the state's energy access data and planning activities.

5.4 Improve coordination

An effective coordination framework is required in states for the effective implementation of OGS projects. This can be achieved through a coordination framework such as an OGS technical working group (TWG) or multi-stakeholder task force consisting of representatives from the private sector, state and federal government institutions and donor organisations. The OGS TWG or task force will be charged with ensuring smooth working relationships among the various stakeholders to minimise overlaps in responsibilities.

Led by the focal state government institution on OGS, the coordination framework should consider the following:

1. *Coordination between relevant state government institutions.* These institutions include MDAs in energy and power, works, land, environment, rural development, GESI, standards, health and social development. Coordination between the relevant state government institutions is important to ensure synergy and provide investors with easier access to relevant OGS state institutions.
2. *Coordination with relevant Federal Government institutions.* These federal institutions include the Ministry of Power, REA, NERC, Standards Organisation of Nigeria and Nigeria Investment Promotion Commission. State governments have highlighted limited or non-existent coordination and exchange of information/data with federal institutions as a challenge for them. This challenge would be eliminated by a coordination framework to guide exchange of information between the federal and state institutions.
3. *Coordination with the private sector.* There needs to be proper exchange of information and engagement between the private sector – OGS providers, investors, donors, industry associations, civil society – and the state governments.

5.5 Facilitate public-private partnership and investment

Meeting Nigeria's electrification targets at the federal and state level will require significant private sector investment. It is estimated that meeting the Federal Government's five million solar household connection target through SHS alone will require at least $675M in additional capital to the already existing funds under NEP.

With limited capacity and budget for OGS, state governments will require support in structuring private-sector partnerships and designing financing models that leverage available government funds. State governments can adapt the existing public-private partnership models under the various REA initiatives and donor programmes. This is important not just in increasing OGS investment in the states, but also ensuring sustainability of projects through joint commitment. This is an area donor programmes and multilateral development finance institutions can support state governments on.

5.6 Improve security

With insecurity posing an increasing risk to OGS development in the states, governments will need to take measures to secure OGS assets in collaboration with local communities. State governments can provide security information to OGS providers to guide their decisions, project deployment and operations. They can also sensitise communities on taking ownership and responsibility for the safety of these assets. In harder to reach and high-risk areas, the governments can subsidise the costs of OGS deployment and provide guarantees to investors to encourage them to scale OGS to these areas.

5.7 Ensure gender and social inclusion

With the rural poor and vulnerable most affected by the lack of energy access, and having the least ability to pay, state governments should ensure gender and socially excluded groups such as persons living with disabilities, refugees, youth and other vulnerable groups are considered and adequately covered in the development of OGS policies and design of OGS projects. Coordination between the focal government institution on OGS and relevant state government institution on GESI can ensure the inclusion of GESI in OGS planning. GESI should also be incorporated in the design and set-up of focal OGS institutions. Donor partners can provide GESI training to state government institutions and develop GESI tools to guide governments in integrating GESI into OGS planning and project delivery.

5.8 Cover low-income households

Leveraging business models, grants, PPPs and technical support from donor partners on OGS electrification, state governments can work with the private sector to extend OGS electrification to rural communities in the states. Government funds can be used to subsidise costs for the rural poor and vulnerable households, either through supply-side or demand-side subsidy initiatives.

5.9 Make budgetary allocations

With state governments recognising the benefits of OGS electrification, there is need to allocate budgets for OGS to meet rural electrification targets and to improve the OGS enabling environment. State OGS budgets could be used as matching funds for OGS electrification projects.

APPENDICES

In this table, we have done a comparative analysis of the Primary States based on the factors highlighted below:

Appendix 1: Comparative analysis of primary states

S/N	Factors	Jigawa	Bauchi	Plateau	Ebonyi	Cross River	Ekiti	Kaduna	Yobe
1.	**State demographics**[12]	Population - 5,804,169 Labour force - 1,553,870 Major occupation - Agriculture	Population - 6,500,468 Labour force - 2,122,724 Major occupation - Agriculture	Population - 4,185,428 Labour force - 2,084,700 Major occupation - Agricultural and mining	Population - 2,869,320 Labour force - 1,528,582 Major occupation - Agriculture	Population - 3,850,352 Labour force - 1,936,998 Major occupation - Agriculture	Population - 3,255,436 Labour force - 1,770,459 Major occupation - Agriculture	Population - 8,216,037 Labour force - 3,504,777 Major occupation - Agriculture	Population - 3,274,478 Labour force - 1,113,650 Major occupation - Agriculture
2.	**Poverty headcount rate**[13]	87.02%	61.53%	55.05%	79.76%	36.3%	28%	43.5%	72.34%
3.	**Energy access**[14] **& electrification statistics**	On-grid electrification rate of 12% with an estimated off-grid population of 4,076,000	On-grid electrification rate of 17% with an estimated off-grid population of 4,093,000	On-grid electrification rate of 31%, with an estimated off-grid population of 2,288,000	On-grid electrification rate of 25%, with an estimated off-grid population of 2,052,000.	On-grid electrification rate of 29%, with an estimated off-grid population of 2,052,000	On-grid electrification rate of 72%, with an estimated off-grid population of 836,000	On-grid electrification rate of 43%, with an estimated off-grid population of 4,146,000	On-grid electrification rate of 19%, with an estimated off-grid population of 1,411,000
4.	**State's economic plans – Focus on electrification**	According to the Jigawa State Comprehensive Development Framework,[15] the targets for power generation and distribution include: (i) facilitation of generation of 30MW of power using renewable energy by the private sector by 2020; (ii) generation of 30MW of power through conventional and renewable sources by 2020; and (iii) provision of an additional 30km of street lighting in urban towns by 2020	Not available	The 2019 Plateau State Development Strategy[16] contains the blueprint for the achievement of the state's vision. According to the strategy, the state intends to attract OGS investors to its agro-hubs and larger off-grid towns. The state will also (i) develop partnerships with off-grid systems providers to offer end-to-end solutions; and (ii) launch a state-wide campaign to demonstrate the benefits of off-grid systems	Not available	Not available	The Ekiti State Integrated Infrastructure Project (EKIIP) with support from the African Development Bank, consists of multiple projects including the Knowledge Economic Park, agriculture and agro processing clusters, transportation networks, small and medium enterprises jobs for youths, and infrastructure and governance initiatives	Under the Kaduna State Development Plan 2016–2020, the state planned to strengthen business infrastructure by expanding power production (including hydroelectric and solar investments) in the state, prioritising industrial areas	Not available

Appendix 1: Comparative analysis of primary states (Continued)

S/N	Factors	Jigawa	Bauchi	Plateau	Ebonyi	Cross River	Ekiti	Kaduna	Yobe
5.	**Policies and regulations**	There is no specific legislation in the state on electricity generation from off-grid sources	Has the Rural Electricity Board Law[17]	Has the Energy Corporation Law that establishes the Plateau State Energy Corporation. The state also has: (i) Rural Electrification Plan; (ii) Policy and Strategy on Renewable Energy; and (iii) Guidelines for Mini-Grid Public-Private Partnership Development	There is no specific legislation in the state on electricity generation from off-grid sources	There is no specific legislation in the state on electricity generation from off-grid sources	Has the Ekiti State Electricity Board Law, 2012, which establishes the Ekiti State Electricity Board (ESEB). The government highlighted the need for its update or new legislation for OGS as the existing law does not cover all renewable energy sources	Has the Kaduna State Power Supply Law, 2015 There is also the Kaduna State Government Policy on Street Lights and the Kaduna Solar Off-Grid Implementation Policy, which is yet to be gazetted	Not available
6.	**State electricity budget**	2–5% of the state's annual budget since 2018 is allocated to OGS projects	Less than 1% of the state's 2021 budget is allocated to OGS projects	About 1% of the state's 2021 budget is allocated to OGS projects	About 2.34% of the state's budget for 2021 is allocated to OGS projects	Not available	Less than 1% of the state's 2021 budget is allocated to OGS projects	About 2.8% of the state's 2021 budget is allocated to OGS projects	Not available
7.	**Stakeholder mapping**	Although the state does not have a Ministry of Energy/ Power, it has a Ministry of Environment that is mandated to provide solar electricity to off-grid populations. The state also incorporated the Alternative Energy Fund Limited in 2001 to coordinate the introduction of other sources of energy such as solar energy	Has the Rural Electricity Board under the state's Ministry of Power, Science and Technology which oversees OGS projects in the state	The state has a Ministry of Water Resources and Energy which focuses mainly on on-grid electrification, and hydro power projects for off-grid locations. The State's Energy Corporation Law also established the Plateau State Energy Corporation as the operational arm of the Ministry[18] to explore renewable energy utilisation	Its Ministry of Power and Energy is responsible for ensuring electrification of the state with available resources	Has a Ministry of Power and an Electrification Agency, but there is little or no information publicly available on their specific functions or projects related to OGS	ESEB is responsible for the supply of power in off-grid areas in the state.[19] There is also the Ekiti State Office of Energy Matters, but the role of this office is unclear	Kaduna Power Supply Company (KAPSCO) under the state's Ministry of Works and Infrastructure is officially charged with the responsibility of increasing electricity access within the state. Its mandate includes the delivery of electricity to off-grid communities through OGS solutions and independent power plants	Has a Ministry of Transportation and Energy responsible for electrification in the state

17 The law was not accessible as at the time of developing this report.

Appendix 1: Comparative analysis of primary states (Continued)

S/N	Factors	Jigawa	Bauchi	Plateau	Ebonyi	Cross River	Ekiti	Kaduna	Yobe
8.	**Investment readiness (Ease of Doing Business[20])**	With a high Ease of Doing Business (EoDB) score (64.36%), Jigawa is investor friendly. The Jigawa State Investment Promotion Agency (JIPA) is responsible for implementing the state's investment promotion roadmap. Notably, one of the priority sectors for JIPA is renewable energy	Has an EoDB score of 60.60%. The Bauchi State Investment Promotion Agency is its focal institution for investment matters	Has an EoDB score of 55.07%. The Plateau Investment and Property Development Company is responsible for coordinating investment opportunities in the state	Has an EoDB score of 51.16%. The Ebonyi State Investment and Property Company Limited is the investment and portfolio management arm of the state government	Has an EoDB score of 49.02% The Cross River Investment Promotion Bureau co-ordinates and monitors all investment promotion activities in the state[21]	Has an EoDB score of 56.81%. The Ekiti State Development and Investment Promotion Agency[22] is charged with promoting investment opportunities and improving the investment climate in the state	Has an EoDB score of 65.97%. The Kaduna State Investment Promotion Agency (KADIPA) is responsible for coordinating and monitoring investment opportunities in the state	Has an EoDB score of 60.02%. The Yobe State Investment Company Limited is the portfolio management arm of the state government
9.	**OGS projects** (exclusive of solar streetlights and solar boreholes)	The state places high priority on solar energy, and piloted several OGS projects in the state under its Millennium Development Goals (MDG) fund. It is also developing the Jigawa Energy City Project, a large-scale grid connected project that will include interconnected mini-grids	The state has a 1.12MW solar hybrid captive power plant in Abubakar Tafawa Balewa University. It also has a number of solar mini-grids and SAS solutions, supported by REA	The state has a 234KW solar hybrid mini-grid. It conducted a power audit on over 500 communities and is seeking to present the report to relevant stakeholders to attract investment	The state has a 2.8MW solar hybrid project at the Alex Ekwueme Federal University, Ndufu Alike-Ikwo under REA.	The state has the GIZ funded 50kW Umon Island solar mini-grid supplying electricity to two communities – Umon Island and Bagana community	Not available	The state has installed a 5KVA solar system that powered the Infectious Disease Control Centre. KAPSCO also partnered with Renewable Energy and Environment Sustainability (REES) for the installation of a 2 MW solar system for local communities[2]	Not available
10	**Gender equality & social inclusion (GESI)**	The Jigawa State Gender Policy was issued in 2013 by the State Ministry of Women Affairs. The policy focuses on incorporating GESI in the design and implementation of government policies and programmes, the private sector and the general public	Has the Ministry of Women Affairs with oversight on GESI matters. The state's Water and Sewage Corporation issued a GESI Action Plan addressing GESI barriers in accessing water, sanitation and hygiene	Has the Ministry of Women Affairs and Social Development with oversight on GESI matters	The Ebonyi State Ministry of Women Affairs and Social Development has oversight on GESI matters in the state	The Cross River State Ministry of Women Affairs has oversight on GESI matters in the state	Has the Ministry of Women Affairs, Social Development and Gender Empowerment and Social Welfare with oversight on GESI matters	Has the Ministry of Human Services and Social Development. The functions of the ministry include promoting women advancement at the state level and oversight on GESI	Has the Ministry of Women Affairs which has oversight on GESI

18 *PM News (2017). Plateau to establish energy corporation.*
19 *Doing Business in Nigeria Report (2018) by World Bank.*
20 *Section 4 of the Cross River Investment Promotion Bureau Law, 2007.*
21 *It is established under the Ekiti State Development and Investment Promotion Law, 2019.*
21 *Section 4 of the Cross River Investment Promotion Bureau Law, 2007.*

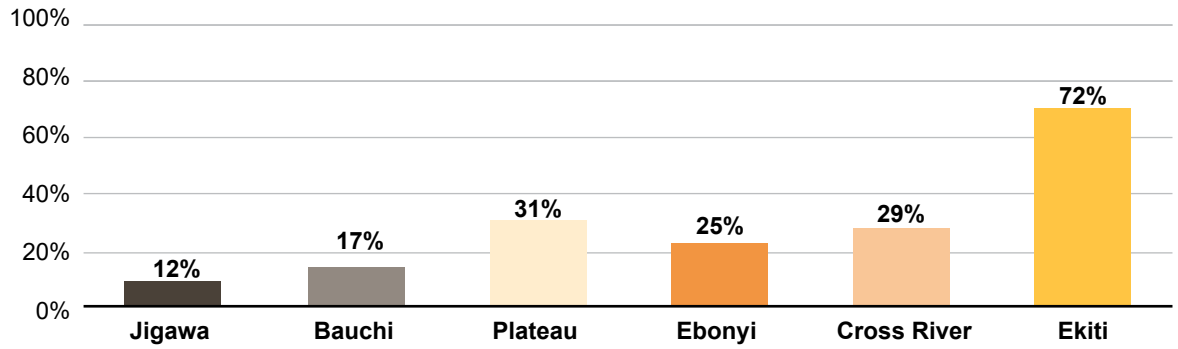


Figure 2: Grid electrification in primary states

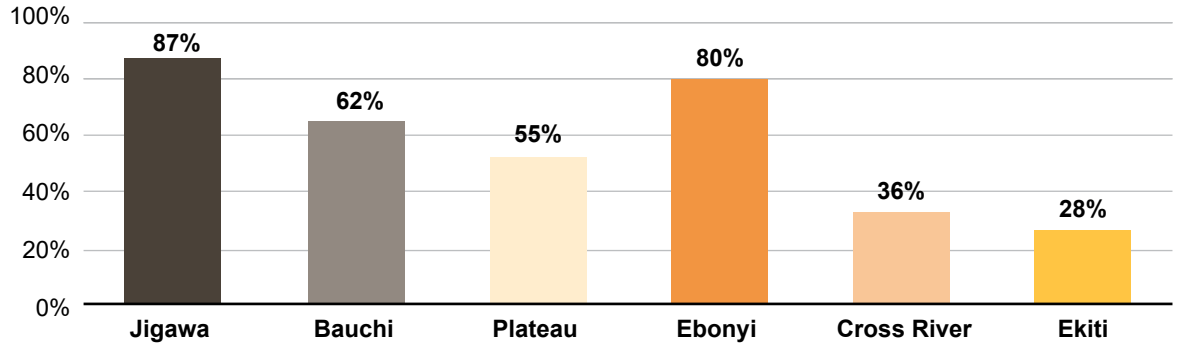


Figure 3: Poverty headcount in primary states

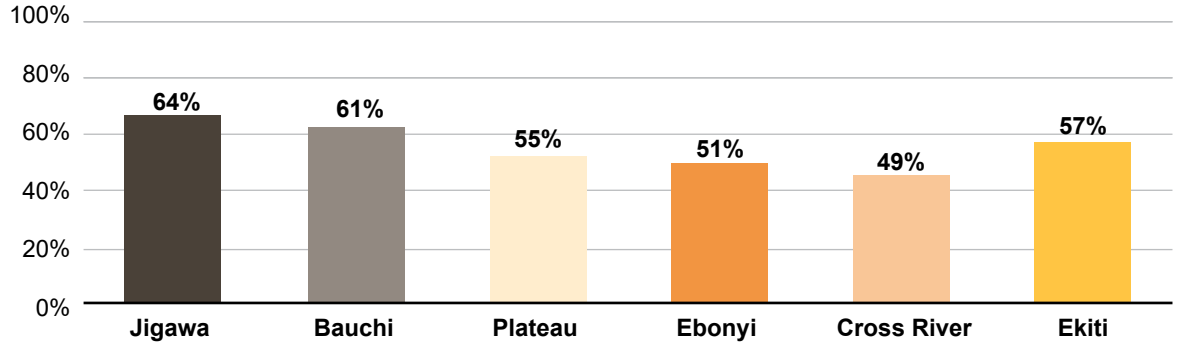


Figure 4: World Bank Ease of Doing Business scores for primary states

Appendix 2: Legal, policy and regulatory framework for off-grid solar at the federal level

S/N	Legislation	Focal institution	Legal/regulatory framework
1.	Constitution of the Federal Republic of Nigeria, 1999	National Assembly State Houses of Assembly	The Constitution empowers the National Assembly to make laws on matters in the Exclusive Legislative List with respect to which it is empowered to make laws in accordance with the provisions of the Constitution.[23] On the other hand, each State House of Assembly is empowered to make laws on: (a) any matter not included in the Exclusive Legislative List, (b) any matter listed in the Concurrent Legislative List to the extent specified therein, and (c) any other matter with respect to which it is empowered to make laws in accordance with the provisions of the Constitution.[24] Both the National Assembly and the State Houses of Assembly, therefore, share legislative powers in respect of matters contained in the Concurrent Legislative List subject to the limitations imposed in the list. By virtue of the Concurrent Legislative List, the power to make laws on electricity is vested in the National Assembly in respect of the following as provided in Paragraph 13 (a) and (b) of the Concurrent Legislative List: (a) electricity and the establishment of electric power stations. (b) the generation and transmission of electricity in or to any part of the Federation and from one state to another state. Paragraph 14 (a), (b) and (c) of the Concurrent Legislative List vests in the State Houses of Assembly the power to make laws on: (a) electricity and the establishment in that state of electric power stations. (b) the generation, transmission and distribution of electricity to areas not covered by a national grid system within that state; and (c) the establishment within that state of any authority for the promotion and management of electric power stations established by the state. The above provisions recognise the powers of both federal and state legislatures to make laws generally on electricity generation, transmission and distribution, although the State House of Assembly is specifically empowered to legislate on off-grid areas within the state (which include OGS by extension) but to the extent that the National Assembly has not enacted a law that covers that area.[25] The Electric Power Sector Reform Act, 2005 (EPSRA), which is a federal legislation, is presumed to have covered this area, though the constitutional power of the National Assembly to override State House of Assembly laws under this doctrine is debatable.

23. *Section 4 (2), (3) and (4) of the 1999 Constitution.*
24. *Section 4 (7) of the 1999 Constitution.*
25. *In the case of Osun State Independent Electoral Commission & Anor. v. AC & ORS. (2010) LPELR-2818(SC), the Nigerian Supreme Court Per Tabai, J.S.C. held that "by the doctrine of covering the field where the National Assembly has enacted a law on a particular subject, a State House of Assembly cannot enact a law on the same subject which is in conflict or inconsistent with the provisions of the enactment of the National Assembly. And where there is such an inconsistency between the provisions of any law enacted by the National Assembly and that enacted by the House of Assembly of a State, the law enacted by the National Assembly shall prevail and the law enacted by the House of Assembly of a State shall, to the extent of the inconsistency, be null and void..."*

Appendix 2: Legal, policy and regulatory framework for off-grid solar at the federal level (Continued)

S/N	Legislation	Focal institution	Legal/regulatory framework
2.	Electric Power Sector Reform Act, 2005 (EPSRA)	Nigerian Electricity Regulatory Commission (NERC) Rural Electrification Agency (REA)	Section 31 of EPSRA establishes NERC, which is the primary regulator of electricity in Nigeria. Its functions include: (a) To ensure adequate supply of electricity to consumers. (b) To ensure the safety, security, reliability and quality of service in the production and delivery of electricity to customers. (c) To ensure that regulation is fair and balanced for licensees, consumers, investors and other stakeholders in the energy sector. Based on the functions of NERC, it is important that state electricity/power regulatory agencies align with EPSRA and NERC regulations such as the 2016 Mini-Grid Regulations.
3.	NERC Mini-Grid Regulations, 2016	NERC	The NERC Mini-Grid Regulations, 2016 are primary regulations that apply to all mini-grid projects in Nigeria. The regulation defines a mini-grid as an electricity supply system with its own power generation and distribution capacity and is used for any isolated or interconnected mini-grid project with a generating capacity of between 0KW and 1MW.
4.	National Energy Policy 2003	Federal Ministry of Power (FMoP)	The policy provides for the development and exploitation of Nigeria's energy resources, and strategies for tackling energy related issues. The major objective of the policy is to ensure the development of Nigeria's energy resources for the achievement of national energy security and an efficient energy delivery system with an optimal energy resource mix. The policy recognises the use of OGS solutions for power supply to unserved areas and the national grid. In terms of solar energy, one of the objectives of the policy is to use solar energy as a complementary energy resource in rural and urban areas. FMoP is the executive arm of the Federal Government of Nigeria responsible for policy formulation in Nigeria's power sector, and as such, is responsible for the implementation of the policy. It is also empowered under EPSRA[26] to give policy directives to NERC in relation to the power sector.
5.	National Renewable Energy and Energy Efficiency Policy, 2015 (NREEEP)	FMoP	NREEEP was issued by FMoP to foster power generation through renewables and energy efficiency capacity by 2020. It also contains provisions for incentives such as capital grant, tax holidays and exemptions for renewable energy developers. One of the strategies in NREEEP with respect to OGS is the development of programmes to facilitate the use of SHS, especially to rural and remote/off-grid areas.
6.	National Energy Efficiency Action Plans, 2016 (2015-2030)	FMoP	The action plan sets out the implementation strategy for NREEEP. It provides concrete policy and regulations, laws, incentives and measures to be implemented to achieve Nigeria's energy efficiency targets and the Sustainable Energy for All (SE4ALL) goals.

26. Section 27 and 28.

Appendix 2: Legal, policy and regulatory framework for off-grid solar at the federal level (Continued)

S/N	Legislation	Focal institution	Legal/regulatory framework
7.	Rural Electrification Strategy and Implementation Plan, 2016	REA	The primary objective of the strategy and implementation plan is to expand access to electricity as rapidly as possible in a cost-effective manner. This implies full use of both grid and off-grid approaches, with subsidies primarily focused on expanding access rather than consumption. It is assumed that private sector providers will be heavily involved in enhancing access through both the successor distribution companies and a range of other public and private companies.
8.	Renewable Energy Master Plan, 2005 (REMP)	Energy Commission of Nigeria (ECN)[27]	REMP encourages the integration of renewables, particularly solar, into Nigeria's energy mix, with an installed capacity target of 75MW by 2015 and 500MW by 2025.
9.	National Renewable Energy Action Plan, 2015 (NREAP)	FMoP	It sets a target for the generation of 30GW of power by 2030 with 30% from renewables. In relation to OGS, NREAP includes solar water heating targets and solar domestic cooking energy targets.
10.	Sustainable Energy for All Action Agenda (SE4ALL-AA)	FMoP	The key objectives of the Nigeria's SE4All objective include: to increase electricity access from the current aggregate level of 40% (urban – 65%, rural – 28%) in 2015 to 75% (urban – 90%, rural – 60%) by 2020; to achieve Nigeria's electricity vision 30:30:30 in terms of a technology-driven renewable energy sector that harnesses the nation's resources to complement its fossil fuel consumption and guarantees energy security.
11.	Renewable Energy Policy Guidelines, 2006 (REPG)	FMoP	REPG articulates policy goals for development of off-grid independent renewables systems and the setting up of a Renewable Electricity Trust Fund as well as cost reflective measures to accelerate renewable projects. It also provides for a five-year tax holiday for investors. It recognises solar energy as a form of renewable energy and includes the introduction of measures to support the local solar energy market as one of the strategies.
12.	Power Sector Reform Programme, 2017 (PSRP)	FMoP and other federal stakeholders	It aims to comprehensively address the systemic challenges in the Nigeria power sector and lays out plans to improve the financial capacity of the Nigeria Buk Electricity Trader (NBET) and improve the viability of the distribution companies in the country. It also recognises the use of solar mini-grids and SHS for energy access.
13.	Nigeria's Nationally Determined Contribution, 2015	Federal Ministry of Environment	Nigeria's Nationally Determined Contribution shows the country's global commitment towards embracing sustainable development measures that limit the rate of global warming and negative impacts of climate change. It contains the country's climate targets and measures to be adopted in achieving them.

27. This is established by Section 1 of the Energy Commission of Nigeria Act, 1989.

Appendix 3: Electrification status in states[28]

NORTH-WEST		NORTH-CENTRAL	
Jigawa	12%	Benue	17%
Kaduna	43%	FCT Abuja	71%
Kano	32%	Kogi	50%
Katsina	14%	Kwara	68%
Kebbi	13%	Nasarawa	31%
Sokoto	13%	Niger	42%
Zamfara	13%	Plateau	31%
NORTH EAST		**SOUTH-WEST**	
Adamawa	35%	Ekiti	72%
Bauchi	17%	Lagos	96%
Borno	34%	Ogun	72%
Gombe	17%	Ondo	72%
Taraba	12%	Osun	71%
Yobe	19%	Oyo	78%
SOUTH-SOUTH		**SOUTH-EAST**	
Akwa Ibom	36%	Abia	52%
Bayelsa	52%	Anambra	78%
Cross River	29%	Ebonyi	25%
Delta	62%	Enugu	25%
Edo	63%	Imo	61%
Rivers	52%		

28. SE4ALL Africa Hub and AfDB (2018). Mini-grid market opportunity assessment: Nigeria report.

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