



**LAGOS STATE GOVERNMENT**

# **THE LAGOS STATE OFF-GRID ELECTRIFICATION STRATEGY AND ACTION PLAN**





LAGOS STATE GOVERNMENT

## ACKNOWLEDGEMENT

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## FOREWORD

Lagos State is the commercial centre of the country with a considerable number of manufacturing and service industries. Lagos State accounts for about 30% of the national GDP and 50% of the non-oil GDP. This is powered by less than 1,000 Megawatts (MW) of electricity supply from the national grid delivered to the two electricity distribution companies (Discos) in the State. Lagos is thus dependent almost entirely on a fleet of no less than 15,000 MW of back-up generator capacity fuelled by expensive and heavily polluting distillates like fuel oil, petrol, and diesel. No progressive and modern economy in the world has thrived in the face of such combination of electricity inadequacy and supply imbalance.

“Making Lagos A 21st Century Economy”, a key component of our T.H.E.M.E.S. agenda, is strategically aimed at growing the critical sectors in the State which is only possible with reliable access to electricity. Lagos State has resolved to drive a new Policy and Strategic Framework that will significantly improve the viability of investments in the Lagos State Electricity Market. The State Government is therefore taking direct responsibility for developing, growing, and regulating a Lagos Electricity Market as prescribed in the 1999 Constitution (amended).

As such, the State Government approved and issued the Lagos State Electricity Policy to articulate the vision of the State on the necessary constitutional, legal, engineering, and commercial foundations for creating



a viable sub-national electricity sector that caters fully to the needs of its citizens, while enabling significant socio-economic growth and development both for Lagos State and the country at large. This Lagos State Off-Grid Electrification Strategy and Action Plan has been developed to support the implementation of the Off-Grid Provisions for the Lagos State Electricity Policy.

On behalf of the State Government, I am grateful to all those who have supported the development of this strategy and plan document. I expect that the all stakeholders will find this Off-Grid Electrification Strategy and Action Plan, the Electricity Policy and the Law emanating therefrom not merely acceptable, but more importantly, the enablers of a better quality of life.

I look forward to seeing this plan produce good results for our people. Working with you and for you, we will together make Lagos State a 21st Century Economy.

DATED AT IKEJA THIS 23RD DAY OF MAY 2022

**ENGR. OLALERE ODUSOTE**

HON. COMMISSIONER,  
MINISTRY OF ENERGY &  
MINERAL RESOURCES,  
LAGOS STATE

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## ABBREVIATIONS

<b>ACE TAF</b>	Africa Clean Energy Technical Assistance Facility
<b>Consultant</b>	Detail Commercial Solicitors. Also referred to as “DETAIL”
<b>DisCo</b>	Distribution Company
<b>DPV</b>	Distributed Solar PV
<b>ICT</b>	Information and Communications Technology
<b>kW</b>	Kilowatts
<b>LCDA</b>	Local Council Development Area
<b>LEM</b>	Lagos Electricity Market
<b>LGA</b>	Local Government Area
<b>M&amp;E</b>	Monitoring and Evaluation
<b>Ministry</b>	Lagos State Ministry of Energy and Mineral Resources
<b>MSME</b>	Micro, Small and Medium-sized Enterprises
<b>OGS</b>	Off-Grid Solutions
<b>OGS Providers</b>	Persons or corporate entities involved in the manufacture, importation, sale, and maintenance of OGS
<b>PWDs</b>	Persons with Disabilities
<b>REA</b>	Rural Electrification Agency
<b>SAS</b>	Stand-Alone Solar Systems (includes Pico Solar Systems, Solar Home Systems and Productive Use Stand Alone appliances)
<b>SHS</b>	Solar Home Systems
<b>SME</b>	Small and Medium-sized Enterprises
<b>State</b>	Lagos State
<b>V</b>	Volts
<b>W</b>	Watts

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## /1/ BACKGROUND

The Lagos State Ministry of Energy and Mineral Resources (the “**Ministry**”) has developed the Lagos State Electricity Policy (the “**Policy**”) which articulates the vision of the State government in creating a viable sub-national electricity sector that caters fully to the needs of its citizens, while enabling significant socio-economic growth for Lagos State (the “**State**”) and Nigeria.

The Policy also proposes the development of a **State Off-Grid Electrification Strategy and Action Plan** which will inform the State’s efforts to incorporate off-grid solutions (OGS) into its electricity mix for increased energy access to its citizens. It will:

- Define the State’s short-, medium-, and long-term targets for OGS.
- Map areas, communities and clusters that would be best suited for the utilization of OGS
- Articulate the role of the State in incentivizing and providing the enabling environment to catalyse private sector investment in creating an OGS ecosystem.
- Establish a Lagos State Off-Grid Electrification Agency as the executing agency for the State OGS Strategy and Plan working with relevant State, Federal Government MDAs and private sector players.
- Provide a basis for developing education, research, sensitization, consumer protection, and capacity building programmes for OGS in the State.
- Set out regulatory principles applicable to OGS and e-waste in the State.
- Promote gender and social

- inclusion in driving electricity access;
- Recognize OGS as a vital component of the State’s IRP; and
- Provide a Monitoring & Evaluation (M&E) framework to track the implementation of the State OGS Strategy and Plan, and attainment of the State’s OGS objectives.

As such, this **State Off-Grid Electrification Strategy and Action Plan** has been developed to support the implementation of the State Electricity Policy specific to Off-Grid Solutions (“**OGS**”). It describes the utilisation of OGS in electrifying un-serveD and under-served areas, boosting macroeconomic activities, building resilience in social and public infrastructure, and improving the quality of life for citizens of the State.

### /1.1/ DEFINITION OF OFF-GRID SOLUTIONS (OGS)

Off-Grid Solutions (OGS) in the context of this document refers to clean energy solutions such as solar, wind, hydro, biomass, and natural gas, utilised for electrification purposes in un-served and under-served areas of the State.

The current version of this document focuses primarily on off-grid solar solutions. Subsequent versions will be updated to include the utilisation of other clean energy sources in the State.

### OFF-GRID SOLAR

Off-grid Solar in the context of this document includes:

- Stand-Alone Solar Systems (“SAS”) comprised of solar home systems (“SHS”), solar energy systems (“SES”).
- Solar mini-grids comprised of isolated solar mini grids and inter-connected solar mini grids.
- OGS Appliances and Equipment comprised of OGS solutions for productive and social uses powered by both SHS and SES.

These are further described below.



**TABLE 1: SOLAR POWER OGS AND DESCRIPTION**

OGS Category	OGS Type	Description
<b>Stand-Alone Solar (SAS)</b>	Solar Home Systems (SHS)	SAS products with peak power ratings between 10W and 350W, and direct current voltage of 35V or less.
	Solar Energy Systems (SES)	SAS products with peak power ratings above 350W and below the capacity of mini grids (typically below 10kW).
<b>Solar Mini-Grids</b>	Isolated Solar Mini-Grids <sup>1</sup>	Mini grids installed in unserved areas with no connections to existing grid distribution networks.
	Interconnected Solar Mini-Grids <sup>2</sup>	Mini grids installed in grid connected areas which utilise existing grid distribution infrastructure in delivering electricity to consumers.
<b>OGS Appliances and Equipment</b>	Productive Use Equipment	OGS powered appliances such as solar water pumps, cold rooms, solar dryers, solar power milling, grinding machines, solar refrigerators, and other solar powered appliances used for economic purposes.
	Social Use Solutions	Stand-alone solar powered solutions such as solar powered water boreholes and solar streetlights used to provide basic social amenities.

<sup>1</sup> Mini-grids are defined by the NERC Regulation for Mini-Grids (2016), Section 3, as “any electricity supply system with its own power generation capacity, supplying electricity to more than one customer and which can operate in isolation from or be connected to a distribution licensee’s network. Within this regulation, the term mini-grid is used for any isolated or interconnected mini-grid generating between 0kW and 1MW of generation capacity.”

<sup>2</sup> Also known as “under-grid” mini-grids

## /2/ SUMMARY OF THE LAGOS STATE ELECTRICITY POLICY

The Lagos State Electricity Policy sets out the State Government's aspirations for increasing the quantity and quality of the energy delivered to residents of Lagos State via a Lagos Electricity Market. It maps a path to assure Lagos State residents of "electricity reliability", a phrase defined here as electricity that is available to any customer in the State Electricity Market in the desired quality and quantity, at the time it is needed with an adequate reserve margin, growing at a rate faster than population growth.

The Policy seeks to provide to Lagosians and the wider public full clarity as to the perspective of the State Government regarding the prospective Lagos Electricity Market; the stakeholders and players, their respective roles, and the constitutional, legal, regulatory, technical, and commercial foundations of the prospective Market. These must all fit together to form a fully functional, steady, and reliable framework that provides universal electricity access to all residents of the State. Considering that the sector is largely owned, operated, and funded by the private sector, and the State Government's conviction that the private sector is the primary engine of growth, this Policy (and the Law that will implement it) must be seen to enable and deepen private sector investment.

### Short term policy objectives (2021 – 2022):

- Enact a comprehensive electricity law by December 31st, 2022 to implement the policy principles and establish an empowered Lagos Off-Grid Electrification Agency and a Lagos Electricity Regulatory Commission.
- Establish a regulatory framework

for, and license, all relevant electricity market entities in Lagos State no later than 31st March 2023; and

- Delineate the LEM from the national electricity market by 31st December 2023.

### Medium-term objectives (2023 – 2028):

- To commence shadow trading of the commercial and technical framework of the LEM by 31st March 2023.
- To commence full commercial LEM operations (credible, commercially-sound, technically compliant, well-funded, financially viable) by 30th December 2023;
- Establish the Market with a clear focus on ensuring minimal adverse environmental impact and minimal recourse to Lagos State Government subsidies or guarantees.
- Achieve a minimum of 30% year-on-year growth in capacity and 75% reliability (average 18 hours of supply daily) 5 years from 2023 with growth in peak energy traded in Lagos State from ~1000MW and ~12,000MWh daily in December 2021 to 4,500MW and 81,000MWh (including a 15% reserve margin) by June 2028.
- A significant reduction in off-grid generator emissions and the fostering of a natural gas market in Lagos through implementing a programme to transit from distillate fuels to natural gas and renewable

sources to fuel the off-grid generator fleet located in the State.

- The adoption of the cleanest, commercially viable modern technologies to deliver electricity to residents of the State using diverse and secure sources of energy.
- The implementation by the Lagos Off- Grid Electrification Agency of a sustainable programme for delivering a minimum of **750MW of new renewable capacity** to the unserved and underserved areas of the State by June 2028; and
- The development of Lagos State as a major global centre for innovation in the provision of electricity access to populations in megacities.

### Long-term objectives (2028 – 2036):

- A reliable supply of electricity in the Lagos Electricity Sector deploying the most efficient generation technologies and providing clean, adequate, and constant access to all citizens.

The Lagos State Ministry of Energy and Mineral Resources (MEMR) will establish channels of communication with various stakeholders and groups within and outside the State Government and the State, to enable feedback to be given and discussed. This feedback will be used to adjust in policy execution as often as is necessary. In addition, the Ministry will organise Electricity Policy Review workshops no less than once every four (4) years and the outcomes therefrom will be processed and inputted into the Policy to produce subsequent editions of the Policy.



## **/3/ JUSTIFICATION FOR OGS**

### **/3.1/ ENERGY DEMAND AND DEFICIT**

Lagos State in 2019 had an estimated population of over 26 million people (26,435,408)<sup>3</sup> and 4,405,902 household electricity connections (average of 6 persons per household)<sup>4</sup>. Electricity in the State is primarily supplied by the Electricity Distribution Companies (“DisCos”) to 20 Local Government Areas (LGAs) which are further divided into 57 local council development areas. Currently, Ikeja DisCo serves 9 LGAs and 1,145,622 registered customers, whilst Eko DisCo serves 10 LGAs and 518,192 registered customers, summing up to 1,663,814 customers. Mushin LGA is jointly served by Ikeja and Eko DisCos<sup>5</sup>.

A long-term load forecast prepared by the Lagos State Government with support from the Power Africa Nigeria Power Sector Program (NPSP) in February 2021 (“Load Forecast”) estimates that 31% of households in Lagos were grid connected as of 2020 based on the total number of registered customers<sup>6</sup>, similar to the 32% estimate by the World Bank<sup>7</sup>. This implies that currently 68 - 69% of households in Lagos are un-connected or off-grid - 4% with no grid infrastructure close to them (>2km) and 64% in close proximity to grid infrastructure (~<=2km). The load forecast also assumes that the highest number of registered customers in Lagos as of 2019 are residential customers (1,294,448) compared to commercial customers (341,582) and industrial class customers

(6,323). The implication of the data above means:

- a. There is a high population of un-served and under-served customers (residential, industrial, and commercial) who are either off grid or utilising self-owned electricity generators, kerosene lamps and other fossil-based energy sources. Survey data also shows that quality of grid supply varies between LGAs with Ibeju-Lekki, Epe, and Badagry being the worse served LGAs.<sup>8</sup> For example, Ibeju Lekki LGA has several communities that have remained unelectrified for 6<sup>9</sup> - 16 years<sup>10</sup>.
- b. It would take, on estimate, about twenty (20) years for un-served households to be connected to the grid based on current estimates and the State’s grid electrification rate.

Although most of the population are close to grid infrastructure, grid electricity supply is insufficient to meet demand. Only 8% of households receive over 16 hours of electricity daily with 60% receiving 0 - 8 hours daily. For non-residential users, these are 12% and 42% respectively<sup>11</sup>. Total electricity demand in Lagos is estimated at about 5 GW with grid supply meeting only 0.9GW, thereby leaving and 3 - 4GW unconstrained demand, most of which is currently being met by generators<sup>12</sup>.

### **/3.2/ MARKET POTENTIAL**

The market opportunity for OGS solutions in Lagos is estimated between \$1.5 - 3 billion with a higher ability and willingness to pay than other states in the country, and demand is growing (up to 7% growth expected by 2030) as grid supply increase may be insufficient to keep up with economic growth<sup>13</sup>. Four use cases have been identified as the most viable for OGS deployment in Lagos state<sup>14</sup>,

- Residential (SHS): 0.6-1.2M lower-income households with total demand of 450-890MW
- Residential (rooftops): 0.5-1M higher-income households with total demand of 500-1000MW
- Commercial & Industrial (SHS): 0.4-0.9M micro-enterprises and market stalls with total demand of 410-820MW
- Commercial & Industrial (rooftops): 41K banks, SMEs, public sector buildings and industrial facilities with total demand of 250-510MW.

Levelized cost of electricity (LCOE) model shows a positive business case for OGS in Lagos,<sup>15</sup>

- For SES, OGS LCOE is 50-65% lower than the current customer spend on electricity (blended grid-diesel tariff)
- For solar home systems, LCOE is higher than petrol generator tariff, but petrol generator are typically adopted where there is no energy access

### **/3.3/ COST EFFICIENCY AND SPEED OF DEPLOYMENT**

The further a community is from the grid, the more expensive the cost of grid extension becomes especially in a privatised electricity market like Lagos. According to a Power For All Report,<sup>16</sup> the cost for a single grid connection is about \$2,500 with such projects having an average duration of nine (9) years and potential to reach of 57,716 persons. On the other hand, a Solar Home System (SHS) typically costs less than \$100 per connection and can be delivered within a few hours with extensive reach constrained only by the availability of technical personnel, project management capacity, and capex funding. Although mini grid projects are more expensive than SHS according to the Sustainable Energy for All (SEforAll) State of the Global Mini-Grid Market Report 2020<sup>17</sup>, they are cheaper than grid extension projects as they typically cost approximately \$1,150 per connection and can be completed within an average of four (4) months.

Consequently, as the cost of grid extension becomes prohibitive, off-grid solar is proving to be a more cost-effective and reliable solution. In areas of high population density, mini grids are more likely to be the viable solution, and SHSs in more sparsely populated areas.

<sup>3</sup> Estimate provided by Lagos State Ministry of Economic Planning and Budget. Source – Power Africa NPSP Long Term Load Forecast 2021 Table 2.1 Page 13

<sup>4</sup> Power Africa NPSP Long Term Load Forecast 2021 Section 4.3 Page 24

<sup>5</sup> Power Africa NPSP Long Term Load Forecast 2021 Table 2.2 Page 14

<sup>6</sup> Power Africa NPSP Long Term Load Forecast 2021 Section 4.1 Page 24

<sup>7</sup> World Bank, 2021 - Studying the Viability and Providing Recommendations to Support Distributed Solar PV in Urban Environments in Nigeria

<sup>8</sup> World Bank, 2021 - Studying the Viability and Providing Recommendations to Support Distributed Solar PV in Urban Environments in Nigeria

<sup>9</sup> Premium Times, 2021 – Sanwo-Olu intervenes in six-year-long power outage in eight Lagos communities. Link - <https://www.premiumtimesng.com/regional/ssouth-west/450384-sanwo-olu-intervenes-in-six-year-long-power-outage-in-eight-lagos-communities.html>

<sup>10</sup> Lekki Daily, 2022 – 16 years of darkness: Residents plead for power supply. Link - <https://lekkidaily.com/featured/555/16-years-of-darkness-residents-plead-for-power-supply/>

<sup>11</sup> Lagos State Government Residential and Non-residential Customer Electricity Survey of ~2000 respondents; June – July 2020; Ikeja DisCo interviews

<sup>12</sup> World Bank, 2021 - Studying the Viability and Providing Recommendations to Support Distributed Solar PV in Urban Environments in Nigeria

<sup>13</sup> ibid

<sup>14</sup> World Bank, 2021 - Studying the Viability and Providing Recommendations to Support Distributed Solar PV in Urban Environments in Nigeria

<sup>15</sup> ibid

<sup>16</sup> Power for All, 2016 - Decentralized Renewables: The Fast Track to Universal Energy Access

<sup>17</sup> SEforAll (2020) State of the Global Mini-Grids Market Report. Link.

### **/3.4/ RESILIENCE FOR PUBLIC AND SOCIAL INFRASTRUCTURE**

Off-grid solar improves resilience for public and social infrastructure given its cost efficiency, modular nature, speed of deployment, and reliability. The fact that off-grid solar solutions are decentralised solutions which are not dependent on the inefficiencies and non-reliability of the grid make them more suitable for public and social infrastructure in health, security, education, transport, and logistics, whilst also providing value for money.

In Lagos, off-grid solar solutions have been deployed to electrify public and social infrastructure including schools, health centres, and government infrastructure. Relevant examples include:

- a. The UK Government Solar Nigeria Project co-funded with the Lagos State Government where 172 schools and 11 off-grid primary health care centres were powered via off-grid solar solutions in the State.
- b. The utilisation of off-grid solar solutions during the 2020 COVID-19 pandemic by various public and private stakeholders to power critical health infrastructure in the State including five (5) medical facilities by Arnergy Solar; installation of a 25kWp solar hybrid mini grid at the National Centre for Disease Control (NCDC) Public Health Laboratory by the Rural Electrification

Agency (REA); and support from the private sector to the State Government in deploying off-grid solar solutions to over 160 emergency facilities and front line workers.

### **/3.5/ ECONOMIC GROWTH, SOCIAL INCLUSION, AND ENVIRONMENTAL SUSTAINABILITY**

Former UN Secretary General Ban Ki-moon describes energy as the golden thread that connects economic growth, social equity, and environmental sustainability<sup>18</sup>. In Lagos where issues around poverty, social equity, and inclusion have become increasingly critical, off-grid solar solutions present a viable means of addressing these issues whilst delivering clean energy access.

#### **GENDER AND SOCIAL INCLUSION**

Off-grid solar solutions improve electricity delivery to women and vulnerable groups who are most impacted by energy poverty while also improving their livelihoods and income through productive uses of electricity. Several off-grid solar providers and social enterprises in Lagos and across the country incorporate business models that empower women and vulnerable groups economically through off-grid solar solutions whilst delivering reliable energy access as well.

#### **JOB CREATION**

The creation of an enabling environment for the utilisation of off-grid solar in the State will create significant job opportunities for citizens, increasing income and state

revenue. According to the Powering Jobs Census 2019 Report, off-grid solar solutions accounted for 4,000 jobs in Nigeria in 2017 and this is expected to increase tenfold by 2023 with most of these jobs in Lagos State where most off-grid solar Providers in the country are based. As the off-grid solar sector scales, there will be increased opportunities across all niches of the off-grid solar market – Distribution, Installation, Entrepreneurship, Manufacturing, Finance, Advisory and Market Development Support, Training & Capacity Building, and Government. Businesses such as MSMEs powered by off-grid solar solutions will provide more employment opportunities as their revenues increase and they expand or scale up.

#### **CLIMATE GOALS**

The Energy sector emissions in Lagos account for 55.1% of Lagos State's total GHG emissions. Electricity to be supplied through OGS including off grid solar is considered clean and will reduce carbon dioxide (CO2) emissions and environmental pollution caused by alternative fossil fuel-based generators such as petrol and diesel generators used across the State. States like Lagos with a coastal borderline are often susceptible to the effects of climate change such as coastal flooding. The use of OGS in the State will support the State's transition towards cleaner energy sources, build resilience, and contribute towards meeting the State's climate change goals under the Lagos State Resilience Strategy, the Lagos Climate Action Plan (Second Five Year Plan 2020 – 2025), and the United Nations Framework Convention on Climate Change (the "Paris Convention"). It also contributes

towards the attainment of Nigeria's Nationally Determined Contributions to the Paris Convention.

### **/3.6/ LAGOS THEMES AGENDA AND THE MINISTRY OF ENERGY'S 10-POINT AGENDA**

The provision of OGS is also imperative for meeting the Lagos State THEMES Agenda, the economic agenda for the current administration of the State. Specifically, OGS will be critical in delivering elements of the THEMES Agenda including Health, Environment, Education, and Technology. It will support in making Lagos a 21st century economy based on the economic empowerment opportunities it presents which include:

- a. Supporting the State to achieve its environmental and climate goals through reduced carbon emissions in electricity generation.
- b. Enabling the State to meet its electrification targets in a faster, cleaner, and cost-effective manner.
- c. Powering health centres especially those in unserved or under-served areas, in a cost-effective and sustainable manner. Utilisation of off-grid solar solutions will improve healthcare services and delivery in the State especially in remote and peri-urban areas.
- d. Improving the quality of education through provision of reliable, clean, and sustainable source of electricity in powering schools

<sup>18</sup> Providing Energy Access through Off Grid Solar- Guidance for governments by GOGLA

<sup>19</sup> Traffic Management and Transportation, Health and Environment, Education and Technology, Making Lagos a 21st Century Economy and Entertainment and Tourism



## /4/ LAGOS STATE OGS TARGETS

- e. and other academic institutions. Supporting technology development in the State through provision of reliable power supply to tech companies and development of innovative indigenous off-grid solutions.

Through this Off-Grid Electrification Strategy and Action Plan, Lagos State will promote and implement OGS electrification programmes and projects in un-served and under-served areas in the State as part of its state electrification plan, and in implementation of the State's Electricity Policy.

### LAGOS STATE OGS TARGETS

The Lagos State Government has set a target to achieve ~1GW Solar PV generation by 2030. This includes electrifying 1.6 million households (36% of households in Lagos) by 2030 and creating 40,000 jobs through OGS as part of its electrification plan ("State OGS Target"). The Lagos State Electrification Agency will be responsible for supporting any updates to the State's OGS targets including the percentage of population to be electrified by OGS on an annual or bi-annual basis, or as determined by the regulator in consultation with the Honourable Commissioner.

The following are the State's broad short,

- Expand existing street lighting network; and Expand LED program to drive energy efficiency solar street lighting.
- Use of mini grids for unconnected and underserved rural/peri-urban areas.
- Electrification of facilities (social and public infrastructure).

Off-grid solar solutions are key for achieving the Solar Initiative (part of the Lagos State Ministry of Energy 10-point Agenda) which seeks to expand existing/past solar programmes to schools and further promote decentralised solar systems including stand-alone solar and mini grids. Some relevant aspects of the Lagos State Ministry of Energy 10-point Agenda include:

**TABLE 2: LAGOS STATE OGS TARGETS**

	2024 (Short Term)	2027 (Medium Term)	2030 (Long Term)
Share of households with OGS	10.0%	25.0%	37.0%
	440,000	1,100,000	1,628,000
Share of SMEs served with OGS	3.0%	7.0%	10.0%
	96,360	224,840	321,000
Share of government institutions served with OGS	10.0%	35.0%	50.0%
Share of public and social infrastructure served with OGS	10.0%	35.0%	50.0%
Share of economic activities served with PuE	3.0%	10.0%	20.0%

medium, and long-term targets for OGS within a 9-year horizon (2021 - 2030).<sup>20</sup>

### COORDINATION WITH FEDERAL GOVERNMENT TARGETS AND INITIATIVES

In its bid to drive the quest for OGS utilization in the country, the Federal Government of Nigeria has set out several policy and regulatory documents for improving electricity delivery in the country through renewable energy sources towards attaining 100% electrification by 2040, inclusive of measure, policy provisions, and targets for OGS. This also includes developing and implementing OGS initiatives and projects with support from multi-lateral finance institutions (MFIs) and donor/development partners.

The Lagos State Off-Grid Electrification Strategy and Action Plan focuses on improving electricity access in Lagos State

through OGS, independently owned and executed by the State government, and as empowered by the 1999 Constitution of the Federal Republic of Nigeria<sup>21</sup> - Sections 13 and 14 of the Concurrent Legislative List, Part II, Second Schedule. As a State under the Federal Republic of Nigeria, this also supports the implementation and attainment of the federal government's OGS objectives and targets, and complements existing federal government efforts towards improving energy access across the country via OGS. Through this Strategy & Action Plan, Lagos State is not only improving the economic livelihood of quality of life of its citizens, but also playing its role in supporting the federal government as a sub-national government as well.

Table 3 below highlights the key federal government policies, regulations, and action plans that cover OGS to which the Lagos State OGS Policy and OGS Action Plan aligns with, complements, and supports.

**TABLE 3: FEDERAL GOVERNMENT POLICY AND REGULATORY DOCUMENTS FOR OGS ELECTRIFICATION**

Key Federal Legislation	Overview
<b>National Renewable Energy and Energy Efficiency Policy (NREEEP), 2015</b>	The National Renewable Energy and Energy Efficiency Policy (NREEEP) sets out the Nigerian government's blueprint to increasingly harness the country's renewable energy and energy efficiency resources in driving sustainable development across the country. Developed in line with the country's national energy policy, the NREEEP outlines the government's programs and measures for deploying renewable energy and energy efficiency technologies and practices towards facilitating Nigeria's green transition.
<b>National Renewable Energy Action Plan</b>	The National Renewable Energy Action Plan (NREAP) sets out the implementation strategy for the National Renewable Energy and Energy Efficiency Policy (NREEEP) (2015). It provides an overview on concrete policy

<sup>20</sup>9-year plan has been proposed in line with the UN SDGs which should be met by 2030

<sup>21</sup>Item 13 of Part II, Schedule 2 to the 1999 Constitution of Nigeria (Concurrent List)

## /5/ MEASURES FOR ACHIEVING THE TARGET

Key Federal Legislation	Overview
<b>(NREAP), 2016</b>	and regulations, laws, incentives and measures, to be implemented to achieve Nigeria's renewable energy targets and the Sustainable Energy for All (SE4ALL) goals.
<b>Sustainable Energy for All - Action Agenda (SE4ALL AA), 2016</b>	Nigeria's Sustainable Energy for All Initiative Action Agenda is the country's implementation document for the global Sustainable Energy for All. It shows Nigeria's commitment towards global sustainable development, and links to the country's policy and regulatory documents on sustainable energy such as the National Renewable Energy and Energy Efficiency Policy (NREEEP), the National Renewable Energy Action Plan (NREAP), the National Energy Efficiency Action Plan (NEEAP), and Nigeria' Nationally Determined Contribution (NDC) to the COP 21 Paris Agreement.  It promotes sustainable energy and energy access and includes a target to increase total off-grid renewable energy capacity to 8,000MW by 2030.
<b>Rural Electrification Strategy and Implementation (RESIP), 2016</b>	The Rural Electrification Strategy and Implementation Plan (RESIP) was developed in line with the federal government's plan for rural electrification and provides the implementation framework and measures for driving rural electrification across the country by means of - on and off-grid energy solutions.
<b>NERC Mini-Grid Regulations, 2016</b>	The Nigerian Electricity Regulatory Commission (NERC) on the 24th of May 2017 released the Mini-Grid Regulations, 2016 as the overarching document governing the development of mini-grid electricity generation - with plant capacity put at anywhere between 0-100kW to 1MW in Nigeria. The regulation oversees all aspects of mini-grid development in Nigeria
<b>Nationally Determined Contribution (NDC)</b>	Nigeria's Nationally Determined Contribution (NDC) shows its global commitment towards embracing sustainable development measures that limit the rate of global warming and negative impacts of climate change. It shows the country's climate targets and measures to be adopted in actualizing them. It promotes adoption of OGS to combat climate change.

The State Government through the State Electrification Agency and the State Ministry of Energy and Mineral Resources will also coordinate with the REA and other relevant government institutions in the participation and inclusion of the State government in federal OGS initiatives such as the Nigeria Electrification project (NEP) and Solar Power Naija Programme (SPN), as well as providing an enabling environment for the allocation of federal OGS projects in the State.

**TABLE 4: SUMMARY OF MEASURES FOR OGS DELIVERY**

	Measure	Category
<b>1</b>	Design and implement State OGS programmes	State OGS Projects & Initiatives
<b>2</b>	Establish the Lagos State Electrification Fund financed through the regulatory activities, government appropriation, donor, and private sector funding	Financing
<b>3</b>	Considerations for potential incentives to attract private sector OGS investment	Incentives
<b>4</b>	Capacity building, and review of requirements to integrate clean energy inclusive of OGS into the academic curriculum of the State	Education and Sensitisation
<b>5</b>	Consumer protection through compliance with established national quality standards, and environmental and e-waste regulations	Consumer Protection
<b>6</b>	Consideration for women and vulnerable groups in OGS delivery, such as consumer finance, etc.	Gender and Social Inclusion
<b>7</b>	Community mapping and data collection for OGS delivery; and energy planning tools for effective OGS delivery	Energy Access Planning and OGS Delivery
<b>8</b>	Public awareness and sensitisation campaigns on the benefits of OGS to encourage adoption	Public Sensitisation and Awareness Creation
<b>9</b>	Effective OGS delivery M&E tracking including the implementation of this Action Plan and OGS Policy in the State	Monitoring & Evaluation

**Following the background and justification for OGS provided above, the State will take the following steps as part of its broad electricity strategy for OGS.**



<sup>22</sup> The discrepancy in targets may be due to the SE4ALL AA aligning to Nigeria's Vision 30:30:30 plan, while the NREAP did not.

## **/5.1/ ENERGY ACCESS PLANNING AND OGS DELIVERY**

### **MAPPING OF GEOGRAPHIES BEST SUITED FOR OGS**

For effective energy access planning and electricity delivery, there is need to map out areas in the State where OGS will be best suited primarily un-served and significantly under-served areas. Factors such as electrification rates, energy sources, demand, population demographic, GDP per capita and poverty rate, productive use, gender, and social inclusion (GESI), social services, and environmental factors, will also be taken into account in mapping out areas for OGS electrification considering that most of the State is urban though largely un-electrified and under-electrified. For example, data from an analysis by the World Bank identified local governments including Agege, Ajeromi-Ifelodun, Mushin, and Shomolu as having the lowest GDP per capita levels in the state populated by low-income households with 80% viable for SHS. Survey data also shows that based on quality of grid supply Ibeju-Lekki, Epe, and Badagry are the worse served LGAs and as such suitable for OGS.<sup>23</sup>

The state will identify and map out off-grid communities, and other relevant areas, in the State for OGS electrification. The State Governor will designate these areas in the State for OGS, based on the recommendations of the Lagos State Electrification Agency, and as empowered by applicable laws. The mapping will also inform the provision of the most ideal OGS or mix for these areas through State

OGS programs. It will be strategic in the utilisation of OGS in electrifying households, social and public infrastructure (health centres, schools, government facilities), and commercial clusters (markets, SME clusters, hubs, and industrial areas). The State will also map out locations in urban areas and cities of the State as 'green areas' to be powered by OGS.

### **INTEGRATED RESOURCE PLANNING, DATA COLLATION, & ANALYSIS**

Expanding energy access sustainably requires proper energy planning and access to transparent data and analytical tools. Credible standardized data, bottom-up approaches, and proxies for estimating current and future energy demand for households and socio-economic activities overlaid with location-specific energy resource availability and infrastructure will enable the design of more viable electrification strategies in the State. Together, these supply and demand indicators enable more comprehensive energy planning.

Effective electricity supply and distribution is dependent on several geospatial factors such as local resources (solar energy) availability, consumer groups, distance from roads and power infrastructure, economic activities, and settlement structures. It is therefore important for the State to ensure that data is gathered in relation to these factors and used to properly plan and address its electricity needs.

As part of its energy access planning and data strategy, the State through the Lagos State Electrification Agency will,

- a. Collaborate with relevant government, donor, and private sector stakeholders to periodically collate ground and geospatial supply and demand side electrification datasets to understand the dynamics of electricity delivery in the State, and electricity needs of various areas. The State will make relevant datasets accessible to the private sector to inform OGS investment and project delivery plans.
- b. Utilise a geo-spatial multi-criteria analysis energy access planning tool that brings together and analyses several spatial data sets on both energy supply and demand for electrification planning and OGS delivery in the State. This tool will also coordinate with existing energy planning tools used in the State and at the federal level relevant for energy access planning in Lagos State as well as the private sector including donor programmes, for comprehensive energy access planning in the State.

## **/5.2/ PRIVATE SECTOR SUPPORT**

A market-based approach in OGS electrification will accelerate electricity access at scale, speed, and least cost to the government.

The State will work with the OGS private sector in developing and employing suitable delivery models for OGS electrification in the State. This will include the role of the State in

incentivising private sector investment, and consider subsidising OGS for the poor and vulnerable citizens of the State. Pursuant to this, the State will consider budgetary provisions in the State's annual budget for OGS electrification projects.

### **FINANCING**

To finance its OGS target of ~1GW Solar PV generation by 2030, Lagos state will require \$1 billion from both government and private sector funding.

The state will set up a State Electrification Fund (the "**Lagos State Electrification Fund**") as empowered by applicable laws, with the Lagos State Electrification Agency responsible for its disbursement. It will be funded by a mix of public finance including State OGS budgetary allocations; private finance from institutional investors, donor and development institutions, multilateral finance institutions, and green and climate finance funds; and any other sources of finance as identified and designated by the State.

The State may consider other relevant private public partnership models such as joint OGS project finance which can be achieved through a special purpose vehicle with the State's contribution through land or capital sourced from the State's electrification fund. The State may also consider concession arrangements to OGS Providers in electrifying areas such as (i) build-own-operate-transfer (BOOT); (ii) build-own-operate (BOO); (iii) build/purchase-own-transfer (BOT); and (iv) power as a service. The State will explore appropriate models in its partnership with the private sector and support appropriate

<sup>23</sup> World Bank, 2021 – Studying the Viability and Providing Recommendations to Support Distributed Solar PV in Urban Environments in Nigeria

private sector models such as Pay-As-You-Go and Lease-To-Own (LTO) where relevant, whilst encouraging gender and social inclusion.

The Lagos State Electrification Fund may also consider providing through its State OGS programmes, consumer financing for off-grid consumers and vulnerable groups to improve affordability and adoption of OGS products. The State will partner with financial institutions, donor programmes, and other relevant stakeholders to support implementation.

### INCENTIVES

The State will consider providing appropriate incentives to attract private sector investment for OGS and encourage OGS delivery to un-served and under-served areas, and vulnerable populations. These incentives may consider the eligibility criteria below:

#### 1. Initial Eligibility Criteria

- a. Duly registered OGS Providers, investors/financiers, market support organisations, or relevant stakeholders involved in,
  - o the development, distribution, and delivery of OGS in un-served, under-served, and OGS designated areas in the State.
  - o local manufacturing/ assembly of OGS products.
  - o providing OGS to state public and social facilities such as schools, health care centres, government buildings and infrastructure, and facilities that benefit

Subject to satisfying the Initial and Qualifying Eligibility Criteria above, the State may consider providing additional support and credit enhancements.

- **Tax Exemptions:** The State may consider exempting eligible stakeholders from certain taxes/duties/fees payable to the State.
- **Guarantees:** The government may consider providing guarantees to the private sector for OGS projects in the State as a means on incentivising and attracting OGS investment and projects to the State.

poor and vulnerable persons in the State.

- o in the business of recycling e-waste from OGS products.
- o Providing OGS for agriculture and productive use activities in the State.

#### 2. Qualifying Eligibility Criteria

Entities who meet the Initial Eligibility Criteria would also be assessed along the following Qualifying Criteria:

- a. Compliance with relevant regulatory authorities such as the Lagos State Internal Revenue Service and Lagos State Residents Registration Agency (LASRRA).
- b. Consideration for low-income households and those at or below the poverty line, vulnerable persons, women, and social excluded persons such as persons with disabilities, and internally displaced persons.

The State will maintain a database of OGS Providers and stakeholders in the State for ease of data collation, provision of incentives where necessary, and monitoring & evaluation (M&E).

### /5.3/ CONSUMER PROTECTION

#### QUALITY STANDARDS

Only quality verified OGS products that meet the relevant national standards as set out by the relevant standards organisations such as the Standards Organisation of Nigeria (SON) will be utilised in State OGS projects and programmes.

The State Government will apply incentives if applicable and other provisions to only quality verified OGS products and components that meet the national IEC standards for the technologies as set by the Standards Organisation of Nigeria

(SON). This will ensure that only quality products get to the consumers and prevent market spoilage caused by poor-quality products in the state. Applying relevant incentives to quality verified OGS products will make them more affordable and reduce consumer patronage of poor-quality products that are usually cheaper and prevalent in the market. This will protect the limited purchasing power of consumers, particularly low-income earners, and ensure value for money.

The State through the Lagos State Electrification Agency will work with SON, Nigeria Customs Service, and other stakeholders such as the renewable energy industry and market associations to ensure quality of OGS products in the State. It will also collaborate and support consumer sensitisation campaigns on quality standards for OGS.

TABLE 5: TECHNICAL STANDARDISATION FOR OGS

OGS Category	OGS Type	Description	Quality Standards	Additional Information
Stand-Alone Solar (SAS)	Solar Home Systems (SHS)	Minimum Tier 2 SHS with power capacity ratings of 50W or 200Wh daily. <sup>25</sup>  Providing a minimum of 4 hours electricity per day and minimum of 2 hours electricity per evening.  Electricity services include general lighting and Phone Charging and Television and Fan (if needed).	As set out by the Standards Organisation of Nigeria (SON):  1. Stand-alone solar (SAS) products rated up to 350W, - NIS IEC TS 62257-9-8.	1. Product warranty period of a minimum of one year must be provided by the supplier.  2. After-sales service for a minimum of one-year will be provided by the supplier to the end-user, including product take-back and recycle or disposal upon product end of life according to NESREA regulations.

<sup>24</sup> International Electrotechnical Commission

<sup>25</sup> Based on the ESMAP Multi-tier Matrix for Measuring Access to Household Electricity Supply

OGS Category	OGS Type	Description	Quality Standards	Additional Information
<b>Stand-Alone Solar (SAS)</b>	Solar Energy Systems (SES)	SAS solution of power capacity between 1kW - 10kW.	As set out by the Standards Organisation of Nigeria (SON):  Technical Requirements  <b>1. Solar PV Module,</b> b. NIS IEC 60904-1 c. NIS IEC 60904-5 d. NIS IEC 60904-8 e. NIS IEC 60904-9	<b>1.</b> Product warranty period of a minimum of one year must be provided by the supplier.  <b>2.</b> After-sales service for a minimum of one-year will be provided by the supplier to the end-user, including product take-back and recycle or disposal upon product end of life according to NESREA regulations.
<b>Solar Mini-Grids</b>	Isolated Solar Mini-Grids	Any electricity supply system with its own power generation capacity (in this context solar), supplying electricity to more than one customer and which can operate in isolation from a distribution licensee's network, generating between 10kW and 1MW of generation capacity.	f. NIS IEC 61215-1-1 g. NIS IEC 61215-1-3 h. NIS IEC 61215-1-4 i. NIS IEC 61215-2 j. NIS IEC 61646 k. NIS IEC 61701  <b>2. Battery,</b> l. NIS IEC 60095-1 m. NIS IEC 60095-2 n. NIS IEC 60095-4 o. NIS IEC 61056-1 p. NIS IEC 61056-2 q. NIS IEC 61427-1 r. NIS IEC 61427-2 s. NIS IEC 62933-1 t. NIS IEC 62933-2-1 u. NIS 25  <b>3. Charge Controller</b> v. NIS IEC 62509  <b>4. Inverter</b> w. NIS IEC 61683 x. NIS IEC 61727	<b>1.</b> Solar mini-grid system design, operation, and management, will comply with guidelines as provided in the NERC Regulations for Mini-Grids, 2016
	Interconnected Solar Mini-Grids	Any electricity supply system with its own power generation capacity (in this context solar), supplying electricity to more than one customer and which can be connected to a distribution licensee's network <sup>26</sup> , generating between 10kW and 1MW of generation capacity.		

OGS Category	OGS Type	Description	Quality Standards	Additional Information
			y. NIS IEC 62116 z. NIS IEC 62891 aa. NIS IEC 62894 bb. NIS IEC TS 62910 cc. NIS IEC 62920 dd. NIS IEC 61000-3-3 ee. NIS IEC TS 61000-3-5 ff. NIS IEC 61W000-3-11  <b>5. Energy Meter</b> gg. NIS IEC TR 62051 hh. NIS IEC TR 62051-1 ii. NIS IEC 62052-11 jj. NIS IEC 62053-11 kk. NIS IEC 62053-21 ll. NIS IEC 62053-31 mm. NIS IEC 62053-61 nn. NIS IEC 62054-21 oo. NIS IEC TR 62055-21 pp. NIS IEC 62055-41 qq. NIS IEC 62055-51 rr. NIS IEC 62055-52 ss. NIS IEC 62056-5-3 tt. NIS IEC 62056-6-1 uu. NIS IEC 62056-6-2	



<sup>26</sup> As defined by the Nigerian Electricity Regulatory Commission, Regulation for Mini-Grids, 2016

OGS Category	OGS Type	Description	Quality Standards	Additional Information
OGS Appliances and Equipment	Productive Use Equipment (PUE)	<p>Any appliance or equipment for agricultural, commercial, or industrial activity that uses solar energy as a direct input to the production of goods or provision of services.</p> <p>This includes solar powered appliance/equipment used for (non-exhaustive),</p> <p><b>vv.</b> Agricultural processes such as irrigation, threshing, land preparation, milling, drying, chilling, night fishing, storage, milking, oil pressing, egg incubation, amongst others.</p> <p><b>ww.</b> Industrial and commercial activities such as clothing, carpentry, construction, electronic/auto repair, hairdressing, restaurant/, transport, retail, phone charging, amongst others.</p>	The solar components of the PUE will comply with the applicable national quality standards set out by SON as provided in this table above. The non-solar component/appliance/equipment will comply with the applicable national standards as set out by SON for such component/equipment/appliance.	
	Social Use Solutions	<p>Any appliance or equipment for social/public activity that uses solar energy as a direct input to the provision of the service.</p> <p>This includes solar powered appliance/equipment used for (non-exhaustive) social/public activities such as education, health services, vaccine and drug storage, and ICT. This includes solar water boreholes, and solar streetlight.</p>		



## E-WASTE

Whilst utilising OGS to improve electricity access in the State, the State Government is also aware of the environmental challenges posed by OGS product e-waste. Therefore, in ensuring a sustainable sector, ensuring a circular approach, and protecting citizens from e-waste, the State Government will ensure adequate and responsible measures are taken for OGS e-waste management in the State.

- a. The State Government, through the Lagos State Electrification Agency, and in collaboration with the Lagos State Ministry of Environment and Water Resources, and other relevant stakeholders, will develop and implement an OGS e-waste take-back and recycling scheme in the State. Already, there are certified recyclers in the State with the capacity to recycle OGS e-waste.
- b. OGS Providers will conform to existing e-waste regulations applicable for OGS as set out by the National Environmental Standards and Regulations Enforcement Agency (NESREA), and provisions set out by the Lagos State Ministry of Environment and Water Resources.
- c. OGS Providers will provide an E-Waste Standard Operating Procedure and Management Plan showing measures for the take-back, recycle, and/or disposal of OGS e-waste including conformance with existing national and state

e-waste regulations and guidelines.

This will also include consumer education on OGS e-waste management and disposal. This will form part of the OGS Provider's broader Environmental Management Plan.

- d. Understanding the difficulty in reaching and further deploying e-waste take-back and recycling schemes in peri-urban and remote areas, the State through the Lagos State Electrification Agency will incentivise OGS Providers who target these areas in ensuring effective e-waste take-back and recycling.
- e. The State Government in collaboration with relevant stakeholders including donor partners, industry association, consumer groups, relevant state government MDAs such as the State Ministry for Information and Strategy, local council, and community leaders, and non-governmental organisations, will provide consumer awareness on OGS e-waste management and disposal, as part of its broader OGS sensitisation campaign.

## /5.4/ EDUCATION AND SENSITISATION

In developing a conducive environment for OGS, consumer education and public sensitisation are critical in creating awareness on OGS electrification, its socio-economic and environmental benefits. The role of the State in ensuring education and

sensitisation on OGS is articulated below.

The State Government will, in collaboration with OGS Providers, donor and development programmes, non-governmental organisations, industry associations, consumer groups, relevant state government MDAs such as the State Ministry for Information and Strategy, and local council and community leaders support Above the Line ("ATL") and Below the Line ("BTL") consumer sensitisation and public awareness campaigns to ensure residents of the State are enlightened on the benefits of OGS, and the State OGS programmes. This may include but not be limited to awareness on the utilisation of OGS products, quality standards, financing, e-waste management, productive uses, and other benefits of OGS. Emphasis will be given to gender and vulnerable groups including considering the development of OGS empowerment programmes for these groups.

The ATL and BTL activities could include but not limited to the following:

- a. Digital media such as radio and television sensitisation programs, and non-digital media such as newspapers, billboards, and other relevant media.
- b. Product demonstration through roadshows and events, and community to community campaigns in un-served and

under-served areas, MSME clusters, and other public areas.

- c. Workshops and events on OGS tailored for the varying demographics of the population.
- d. Sensitisation through associations, cooperatives, and other consumer groups.

The State may also support the education and sensitisation of academic institutions on OGS with the aim of building relevant OGS skills and expertise in the State, while also recognising the jobs of the present and future in clean energy. As such, the State will consider,

- a. Including clean energy courses inclusive of OGS into the academic curriculum and subjects such as basic science, design and technology, engineering, and environmental sciences in State academic institutions.
- b. Partnering with private sector OGS providers to conduct state-wide campaigns and tours in both private and public schools in the State with OGS product demonstrations.
- c. Supporting students and lecturers/teachers with research grants on OGS and related research areas.
- d. Developing skills acquisition, mentoring, and other technical and non-technical programmes on clean energy inclusive of OGS especially for female students.

## **/5.5/ GENDER AND SOCIAL INCLUSION**

OGS has been proven to have significant socio-economic benefits for women and vulnerable groups, who are most impacted by the lack of energy access.

The State will consider and subject to funding availability prioritise OGS delivery to vulnerable groups including women, persons with disabilities, youth, internally displaced persons, and other vulnerable persons and social classes, especially the vulnerable poor in economically disadvantaged areas of the State.

### **PRACTICAL MEASURES**

The State through the Lagos State Electrification Agency working with OGS providers/operators (as applicable), relevant MDAs, and other relevant stakeholders will implement the following measures.

- a. Consider GESI and targeting areas with considerable GESI population in developing State OGS programmes and projects. The Lagos State Electrification Agency may periodically review and set targets for GESI empowerment through OGS in the State.
- b. Promote GESI balance in the State's MDAs tasked with OGS related responsibilities.
- c. Support GESI sensitisation campaigns for OGS in the State.
- d. Consider setting out GESI guidelines for OGS Providers

- e. Consider the provision of OGS financing to subsidise the cost of OGS delivery to GESI groups and the poor.
- f. Encourage OGS empowerment programmes for artisans to build capacity and entrepreneurial skills on OGS with emphasis to GESI groups.

## **/6/ ROLES AND RESPONSIBILITIES OF STAKEHOLDERS**

The State will designate a focal agency for overseeing OGS implementation in the State, and coordination with relevant public and private sector stakeholders. This will include oversight of the legal and regulatory framework for OGS in the State which will be cognisant of and in alignment with the existing legal and regulatory framework at the federal level. It will also coordinate with the relevant federal government institutions with a mandate to facilitate the development of OGS.

### **/6.1/ THE ROLE OF THE LAGOS STATE ELECTRIFICATION AGENCY**

The Lagos State Electrification Agency will be responsible for integrating OGS into the State's electrification plan and implementation of OGS in the State. Key responsibilities for the Lagos State

Electrification Agency will include:

- a. Implementation of this State Off-Grid Electrification Strategy and Action Plan, and other policy and regulatory provisions for OGS in the State.
- b. Development, oversight, supervision, and M&E of State OGS projects and programmes.
- c. Coordination with the private sector including OGS Providers, investors, financiers, donor and development programmes, market development organisations, and other relevant OGS stakeholders in the State.
- d. Facilitating relevant regulatory and project requirements for OGS projects and programmes in the State.
- e. Oversight, management, utilisation, and disbursement of the State Electrification Fund. This will also include exploring potential sources of finance for the fund from public and private sector sources.
- f. Application of incentives for OGS in the State.
- g. All other responsibilities relevant for the effective delivery of OGS electrification in the State.

In general, the Lagos State Electrification Agency will lead and supervise the State government OGS projects as well as have oversight on OGS projects implemented by other stakeholders such as the federal government and donor programmes in the State; collate and analyse OGS related data in the State; coordinate with key public

and private stakeholders at the State and federal level; and establish State OGS-based electrification plans. The latter task can be executed in collaboration with the Rural Electrification Agency to also align with the national electrification target and plan for OGS.

In exercising its role, the Lagos State Electrification Agency may from time to time establish a Taskforce or Technical Working Group (TWG) under its supervision to advise and support the implementation of its OGS plans, programmes, and projects in the State.

The Taskforce/TWG may consist of representatives of both private and public stakeholders such as:

- a. Lagos State Ministry of Energy and Mineral Resources
- b. Private sector industry associations such as the Renewable Energy Association of Nigeria
- c. Development partners and donor programmes
- d. Market development organisations and non-governmental organisations in the OGS sector
- e. OGS sector participants / operators, experts, and consultants (as nominated by the Lagos State Electrification Agency)
- f. Relevant state or federal government ministries, departments, or agencies such as the Ministry of Economic Planning and Budget, Ministry of Women Affairs and Social



Development, Standards Organisation, Environmental Regulator, Lagos State Internal Revenue Service, etc.

- g. Any other relevant stakeholder such as development finance institutions and social/consumer groups as identified by the Lagos State Electrification Agency.

### **/6.2/ COORDINATION WITH FEDERAL AND STATE GOVERNMENT INSTITUTIONS**

In implementing this State Off-Grid Electrification Strategy and Action Plan, the Lagos State Electrification Agency will coordinate with federal, state, and local government institutions and stakeholders.

At the State and local government level, these may include but not limited to;

- a. State Ministries of Finance; Economic Planning and Budget; Environment and Water Resources; Works and Infrastructure; Youth and Social Development; Health; Agriculture; Education; Women and Poverty Alleviation; and Local Government & Community Affairs. Others may include relevant agencies and parastatals such as the State Internal Revenue Service, Lands Bureau, and Local Government Service Commission.
- b. Local Government Authorities /

Local Council Development Authorities to:

- i. Identify unserved and under-served areas within the State eligible for OGS, and ensure proper electrification planning
- ii. Carry out consumer education and public sensitisation on the benefits of OGS, and
- iii. Ensure community ownership, utilisation, and sustainability of State OGS electrification projects.

At the federal government level, these may include but not limited to;

- a. The Federal Ministry of Power
- b. Nigerian Electricity Regulatory Commission
- c. The Rural Electrification Agency (REA)
- d. Nigerian Electricity Management Services Agency (NEMSA)
- e. The Standards Organisation of Nigeria (SON)
- f. Other relevant federal ministries and agencies such as the Federal Ministry of Environment, and National Environmental Standards Regulatory and Enforcement Agency (NESREA).

The Lagos State Electrification Agency will lead and coordinate activities with all relevant federal, state, and local ministries, departments, or agencies (MDAs) in the implementation of OGS in the State.

### **/6.3/ ROLE OF PRIVATE SECTOR IN OGS DELIVERY**

**TABLE 6: ROLE OF PRIVATE SECTOR IN OGS DELIVERY**

<b>Stakeholder</b>	<b>Role</b>
<b>Donor &amp; Development Partners</b>	Support through the provision of grants, funding contribution to the Lagos State Electrification Fund, technical assistance, advisory, and any other relevant support for the implementation of this OGS Action Plan and the OGS Policy
<b>Financiers &amp; Investors</b>	Provision of finance – grants, development finance, low interest loans, consumer finance, equity, project finance, guarantees, and other financial instruments to support State OGS projects
<b>Private Sector Industry Associations</b>	OGS project development and OGS product distribution in the State according to the provisions and measures laid out in the Lagos State Electricity Policy and this Strategy & Action Plan, and as led by the Lagos State Electrification Agency. Implementation of OGS projects in the State including upstream (OGS local assembly and manufacturing) and downstream (SAS and PUE distribution, and solar mini-grid development)
<b>NGOs &amp; Civil Society</b>	Provision of public accountability and advisory to the State government on OGS delivery, as well as public awareness/sensitisation to the citizens on the benefits and adoption of OGS in the State
<b>Market Development Organisations</b>	Provision of technical assistance, advisory and related support for the development of the state's OGS sector
<b>Consumer Groups and Associations</b>	Advocacy and advisory for the consumer protection in OGS delivery in the State, as well as public awareness/sensitisation to the citizens on the benefits and adoption of OGS in the State
<b>Academia and Research Institutes</b>	Technical and non-technical research and skills development for OGS in the State.

## /7/ NEXT STEPS

The following are proposed steps to commence the implementation of this State Off-Grid Electrification Strategy and Action Plan.

**TABLE 7: NEXT STEPS – SHORT, MEDIUM, LONG TERM**

Timeline	Description	
<b>Short Term Target</b>	<p>Establishment of Institutional, Legal and Enabling Environment for OGS.</p> <ul style="list-style-type: none"> <li>• Enactment of a Lagos State Electricity Law covering OGS.</li> <li>• Set-up of the Lagos State Electrification Agency for OGS electrification in the State.</li> <li>• Set up of the Lagos State Electrification Fund.</li> <li>• Funding and capacity training for the Lagos State Electrification Agency in the implementation of the State's Off-Grid Electrification Strategy and Action Plan, and the State's Electricity Policy.</li> <li>• Availability of an integrated energy resource and data gathering plan (including geospatial tool(s)) for OGS energy access planning in the State.</li> <li>• Availability of a State OGS E-waste take-back and recycling scheme for the State.</li> <li>• Mapping and designation of un-served and under-served areas in the State for OGS electrification.</li> <li>• Application of relevant incentives for OGS in the State.</li> <li>• Development and implementation of at least one State OGS programme/project</li> </ul>	By 2023
<b>Medium Term Target</b>	<p>OGS programme and project implementation in meeting the State's OGS target</p> <ul style="list-style-type: none"> <li>• Development and implementation of State OGS programmes and projects in line with the State's OGS electrification target.</li> <li>• Design and implementation of a State OGS financing initiative to scale OGS delivery in the State.</li> <li>• Sustainable funding and capacity building for the Lagos State Electrification Agency to operate a fully functional OGS electrification unit.</li> <li>• Development of technical and non-technical OGS skills development programmes in the State.</li> <li>• Facilitating investment and establishment of OGS manufacturing/assembly plants in the State.</li> </ul>	By 2025
<b>Long Term Target</b>	<p>Creation of a robust, smart, efficient, and inter-connected electricity system with a mix of clean energy sources.</p> <ul style="list-style-type: none"> <li>• Continuous development and implementation of State OGS programmes and projects in line with the State's OGS electrification target.</li> <li>• Re-evaluation of Integrated Energy Resource Plan based on population growth and State energy needs.</li> <li>• Integrating off-grid solutions (such as solar mini-grids) and on-grid infrastructure to create a robust, smart, efficient, and inter-connected electricity system with a mix of clean energy sources.</li> </ul>	By 2030



**TABLE 8: NEXT STEPS – YEAR BY YEAR**

No.	Task	Responsible Institution	Timeline
1	Enactment of a Lagos State Electricity Law covering OGS	The State House of Assembly, State Ministry of Justice, and State Ministry of Energy and Mineral Resources	Q4 2022
2	Set-Up of the Lagos State Off-Grid Electrification Agency (Lagos State Electrification Agency)	The State House of Assembly and State Ministry of Energy and Mineral Resources	Q4 2022
3	Commence the implementation of this document and off-grid energy provisions in the State Electricity Policy. Identify needs of the Lagos State Electrification Agency – staff training, funding, and technical tools	Lagos State Electrification Agency	Q1 2023
4	Stakeholder engagement on support to the Lagos State Electrification Agency, and coordination with relevant State government MDAs, federal government MDAs, donor programmes, multilateral development finance institutions (DFIs), OGS market development organisations, industry associations	Lagos State Electrification Agency and State Ministry of Energy and Mineral Resources	Q4 2022
5	Establish funding for the Lagos State Electrification Agency – State government, donor programmes, multilateral DFIs	Lagos State Electrification Agency, State Ministry of Finance, State Ministry of Energy and Mineral Resources	Q4 2022
6	Consider the establishment of the Lagos State OGS Electrification Fund	Lagos State Electrification Agency, Ministry of Finance, State Ministry of Economic Planning and Budget, State Ministry of Energy and Mineral Resources	Q1 2023
7	Mapping communities, designated areas powered by clean energy sources, facilities, and other relevant infrastructure for OGS electrification. Utilise geo-spatial tool for energy access planning in the State	Lagos State Electrification Agency and Ministry of Energy and Mineral Resources	Q4 2022
8	Identify all existing OGS programmes and projects in the State – government and donor programmes – and create a state database for effective monitoring and evaluation. This will be updated as future OGS programmes and projects are implemented.	Lagos State Electrification Agency	Q1 2023

No.	Task	Responsible Institution	Timeline
9	Develop State OGS Programme incorporating provisions in this document and the State Electricity Policy	Lagos State Electrification Agency	Q2 2023
10	Implement State OGS Programme and at least one project	Lagos State Electrification Agency; State Ministry of Energy and Mineral Resources	Q3 2023
11	Monitoring & Evaluation (utilising the M&E tool in annex of this document)	Lagos State Electrification Agency	Annually
12	Review, develop and implement State OGS programmes and projects incrementally based on the State's electrification plan.	Lagos State Electrification Agency; OGS Stakeholders and State Ministry of Energy and Mineral Resources	2024 - 2030





