

## **MINI-GRIDS AS CATALYST FOR RENEWABLE ELECTRICITY ACCESS: AN OVERVIEW OF EXTANT LAWS**

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### **Introduction:**

Electricity access remains a crucial challenge in Nigeria, considerably impacting the country's economic development, education, healthcare, and overall quality of life. Despite being Africa's most populous nation with over 200 million people and laden with significant energy resources, the country still faces persistent issues related to electricity generation, distribution, and accessibility. It is estimated that roughly 90 million people were without electricity in 2023,<sup>2</sup> the highest deficit in Africa. This is the result of increased population, poor infrastructure, and insufficient generation capacity to meet the growing demands of citizens. The national power grid, which links electricity generation stations with electrical loads across the country, is hampered by inefficiencies and constrained by infrastructure limitations. The grid, which has collapsed on numerous occasions, plunging the country into darkness, struggles to reach remote and underserved areas. Electricity, which contributes significantly to a country's economic growth and development has a very deplorable supply rate in Nigeria, adversely affecting businesses. According to a report by the World Bank, Nigerian businesses lose an estimated \$29 billion annually due to unreliable electricity.<sup>3</sup> To effectively address this issue of abysmal electricity supply, mini-grids have emerged as a potential catalyst, offering improved and reliable power supply, and providing decentralized and sustainable solutions to the country's electricity crisis. The core of this article is to highlight the role of mini-grids in solving these electricity problems and examine the existing legal framework for the establishment of mini-grids in Nigeria.

### **Mini-Grids: A Catalyst for Improved Electricity Access:**

Essentially, mini-grids are decentralized electricity generation and distribution systems that serve specific groups of consumers. Unlike the centralized national power grid that transmits electricity over long distances, mini-grids are designed to provide electricity to specific groups, especially in areas where it may be challenging or economically tasking to connect to the national grid. Section 3 of the Mini-Grid Regulations, 2023, defines Mini-Grid as any electricity supply system with its generation capacity, supplying electricity to more than one customer, and which can either operate in isolation from a Distribution Licensee's network or be connected to the network. Mini-grids have also been described as small-scale electricity generators and possibly energy storage systems interconnected to a distribution network that supplies electricity to a small, localized group of customers, operates independently of the national transmission grid, and ranges from a few kilowatts up to 10 megawatts in size.<sup>4</sup> From the provisions of the Mini-Grid Regulations, 2023 it can be deduced that there are essentially two (2) major categories of mini-grids in Nigeria, namely

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<sup>2</sup> Can Mini Grids Solve Nigeria's Electricity Access Problem? <https://businessday.ng/editorial/article/can-mini-grids-solve-nigerias-electricity-access-problem/>. Accessed 16<sup>th</sup> January, 2024.

<sup>3</sup> O. Udegbumam, Nigeria Businesses Lose \$29bn Annually to Poor Electricity <https://www.premiumtimesng.com/news/top-news/456904-nigeria-businesses-lose-29-billion-annually-to-poor-electricity.html?tztc=1>. Accessed 16<sup>th</sup> January, 2024.

<sup>4</sup> Green Mini-Grid Help Desk, Introduction to Mini-Grids <https://greenminigrad.afdb.org/how-it-works/help-desk-developers-and-operators/introduction-mini-grids>. Accessed 16<sup>th</sup> January, 2024.

interconnected mini-grids, and isolated mini-grids.<sup>5</sup> An interconnected mini-grid is connected to the network of a Distribution Licensee while an isolated mini-grid is not connected to a Distribution Licensee network.<sup>6</sup> While an interconnected mini-grid utilizes the existing infrastructure of an electricity distribution company to transmit power, an isolated mini-grid establishes its distribution infrastructure. Additionally, the Regulations also allude to another set of mini-grids known as portfolios. A portfolio of isolated mini-grids connotes a set of isolated mini-grids as determined by the mini-grid developer, which is filed with the Commission for approval simultaneously.<sup>7</sup> Conversely, a portfolio of interconnected mini-grids means a set of interconnected mini-grids as determined by the mini-grid developer, for which tripartite agreements with the same Distribution Licensee have been signed and filed simultaneously with the Commission for approval.<sup>8</sup>

Mini-grids have been identified as a viable solution to Nigeria's electricity crisis owing to the numerous advantages they offer over the national grid, especially for rural, unserved, and underserved areas, as over 76% of people living in these areas have zero access to electricity.<sup>9</sup> Mini-grids can help enhance electricity in rural and unserved areas, as well as improve livelihoods, boost economic activities, generate employment, and improve overall quality of life. They are reliable and more affordable, and power outages are less likely to be recorded with mini-grids than with the conventional national grid system, which distributes power over long distances. Mini-grids can be operated by the government, private individuals, businesses, communities, and different stakeholders through Private and Public Partnerships. This decentralized nature of mini-grids indeed presents an opportunity for electrification through diversification and for Nigeria to address its electricity access crisis. Unlike the conventional national power grid system, mini-grids can be deployed in areas where extending the national grid is unfeasible and economically impracticable. Mini-grids are the solution to Nigeria's electricity crisis. Although Nigeria has commenced exploring the use of mini-grids as part of its efforts to address electricity access challenges, especially in rural, unserved, and underserved areas through the Nigeria Electrification Project ("NEP") Initiative,<sup>10</sup> more concerted efforts are necessary to scale up these initiatives, overcome the barriers associated with mini-grid installation, such as funding constraints, and ensure sustainable and reliable electricity across the nation.

### **Legal Framework for Mini-Grids in Nigeria:**

An efficient legal framework that is clear and well-defined for mini-grids in Nigeria is pertinent for several reasons, as it is crucial in shaping the development, use, and sustainability of decentralized electricity distribution systems such as mini-grids. A clearly defined legal

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<sup>5</sup> Section 5 of the Mini-Grid Regulations, 2023.

<sup>6</sup> Section 3 of the Mini-Grid Regulations, 2023.

<sup>7</sup> Section 3 of the Mini-Grid Regulations, 2023

<sup>8</sup> *ibid*

<sup>9</sup> K, Jeremiah, Nigeria's Unserved, Underserved Communities and Federal Government's Rural Electrification Goals <https://guardian.ng/energy/nigerias-unserved-underserved-communities-and-fgs-rural-electrification-goals/>. Accessed 16<sup>th</sup> January, 2024.

<sup>10</sup> The Managing director of the Rural Electrification Agency had in 2023 reported that, through the NEP, over 80 mini-grids were completed and commissioned, connecting about 32,000 households, Micro and Small Medium Enterprises ("MSMEs"), and public facilities and providing clean and reliable electricity. The report can be accessed here <https://www.premiumtimesng.com/news/more-news/617427-103-mini-grids-built-across-nigeria-says-rural-electrification-agency.html>. Accessed 16<sup>th</sup> January, 2024.

framework will give investors confidence, making mini-grids more attractive for investors to commit their resources to. This will ultimately lead to the development of more mini-grids and accelerate the pace of electrification through mini-grids. In Nigeria, mini-grids are primarily regulated by the Electricity Act of 2023 and the Mini-Grid Regulations, of 2023 made pursuant thereto.

### ***Electricity Act 2023***

The overarching objectives of the Electricity Act, 2023 (“the Act”) are to provide a comprehensive legal framework to facilitate the operation of a privatized and contract-based electricity market, to attract private sector investments to the entire value chain of the Nigerian Electricity Supply Industry (“NESI”), to stimulate regulatory measures to scale up efficient power generation, transmission, and distribution to achieve reliable electricity access nationwide, and to provide a legal framework for improving access to electricity in rural, unserved, underserved, and urban areas via the use of conventional energy sources and renewable off-grid and mini-grid solutions.<sup>11</sup> The Act includes provisions about licensing for electricity generation, distribution, and transmission, along with issues relating to renewable energy, decentralization of the power sector, tariffs, subsidies, and rural electrification through mini-grids. Additionally, on the strength of the amendment to the 1999 Constitution of the Federal Republic of Nigeria (Fifth Amendment), which expands the legislative powers of States to include the generation, transmission, and distribution of electricity in areas covered by the national grid, the Act empowers states, companies, and private individuals to engage in the generation, transmission, and distribution of electricity. The Act empowers states to enact laws permitting private individuals to obtain licenses for the construction, ownership, and/or operation of ventures involved in the generation, transmission, distribution, supply, and sale of electricity.<sup>12</sup> On mini-grids, the Act confers exclusive powers on the State Electricity Board or authority to issue licenses for mini-grids operations, Independent Electricity Distribution Networks (“IEDNs”), Independent Electricity Distribution Network Operators (“IEDNOs”), Independent Electricity Transmission Networks (“IETNs”), and Independent Electricity Transmission Network Operators (“IETNOs”).

States are also required to provide the framework for the operation of the licenses and the framework for investment in electricity within the state. Where a state has no legal or institutional framework to regulate mini-grid operations or IEDN/IEDNO and IETNO/IETN electricity-related issues, the Nigerian Electricity Regulatory Commission (“NERC”) shall exercise legal and regulatory powers over these issues in such state.<sup>13</sup> Although the Act failed to define what mini-grids are or provide in detail how mini-grid projects and operations are to be executed, it is still a laudable enactment that holds the promise of reducing over-dependence on the national grid power system and promoting improved electricity access across the nation, especially in rural, unserved, and underserved areas.

### ***Mini-Grid Regulations 2023***

The Electricity Act, 2023, under Section 226 empowers the Nigerian Electricity Regulatory Commission (“the Commission”) to make regulations to properly give effect to the provisions of the Act. In the exercise of these powers, the Mini-Grid Regulations, 2023 (the “Regulations”) were

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<sup>11</sup> Section 1 of the Electricity Act, 2023.

<sup>12</sup> Section 63(1) of the Electricity Act, 2023

<sup>13</sup> Section 63(7) of the Electricity Act, 2023.

made by the Commission to provide a regulatory framework for the development, deployment, and operation of mini-grids in Nigeria. The Regulation which was recently signed into law on 29<sup>th</sup> December, 2023 provides a structured procedure for the application and grant of permits and licenses to mini-grid developers to develop, own, maintain, and operate any type of mini-grid. Under the provisions of the Regulations, two options are open to a developer of an isolated mini-grid with a distributed power not exceeding 100 kW. The developer can choose either to apply for a permit to operate an isolated mini-grid and be subject to the associated rights and obligations as prescribed under the Regulations or simply opt for registration as a mini-grid operator with the Commission.<sup>14</sup> Conversely, developers of isolated mini-grids which are larger than 100 KW of distributed power and have up to 1 MW of generation capacity do not have the luxury of choosing from two options as they are mandated to obtain a permit from the Commission before commencing their mini-grids project. This permit is usually granted to the developer upon fulfilment of the conditions stipulated in the Regulations.<sup>15</sup>

For interconnected mini-grids, the Regulations require the mini-grid developers, the authorized representatives of the connected community, and the Distribution Company to sign a tripartite contract for the project, which is then filed with the Commission for approval and registration. The commission will then issue a mini-grid permit upon fulfilment of the conditions stipulated in the regulations.<sup>16</sup> The Regulations further grant mini-grid operators flexibility in determining tariffs, enabling them to tailor pricing to specific community needs. In determining tariffs, a registered mini-grid operator can either adopt the Multi-Year Tariff Order (“MYTO”) calculation method or set the tariff through an agreement with the community where the mini-grid is located, represented by customers consuming not less than 60% of the mini-grids electrical output.<sup>17</sup> A mini-grid permit holder is required to operate only in the geographical area approved and defined in its permit or tripartite contract,<sup>18</sup> and in instances where a Distribution Company (“Disco”) intends to extend its network to an isolated mini-grid operating under a permit, the Disco shall not later than twelve (12) months before the grid extension is expected to reach the isolated mini-grid in writing.<sup>19</sup> If a Disco extends its network to an isolated mini-grid operated under a permit, the isolated mini-grid permit holder may opt to either convert to an interconnected mini-grid operator or transfer all the distribution assets of the isolated mini-grid to the Disco in exchange for compensation.<sup>20</sup> To protect the interests of isolated mini-grid permit holders, the Regulations permit them to continue operating the mini-grid until full compensation from the Disco is received, and the Disco is prohibited from disrupting or obstructing the mini-grid permit holder.<sup>21</sup> This guarantees an equitable exchange among the parties and promotes a seamless transfer.

The Regulations also protect the interests of a registered mini-grid operator to the effect that in situations where a Disco expands its distribution network to an area serviced by a registered mini-grid, the registered mini-grid operator, on request of the Disco shall decommission and remove all

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<sup>14</sup> Section 8 of the Mini-Grid Regulations, 2023.

<sup>15</sup> Section 7 of the Mini-Grid Regulations, 2023 expressly spells out the conditions to be satisfied.

<sup>16</sup> Section 9 of the Mini-Grid Regulations, 2023.

<sup>17</sup> Section 22(5) of the Mini-Grid Regulations, 2023.

<sup>18</sup> Section 20(1) of the Mini-Grid Regulations, 2023.

<sup>19</sup> Section 20(2) of the Mini-Grid Regulations, 2023.

<sup>20</sup> Section 20(3)(b) of the Mini-Grid Regulations, 2023 outlines in detail the compensation structure.

<sup>21</sup> Section 20(4) of the Mini-Grid Regulations, 2023.

its assets and equipment within two (2) months after the Disco has commenced operations in the area. A decommissioning plan is to be jointly filed by both the registered mini-grid operator and the Disco with the Commission before the installation of the Disco's infrastructure to ensure safety throughout the process.<sup>22</sup> The Regulations do not, however, provide for compensation for a registered mini-grid operator where a Disco extends its distribution network to cover an area operated by such operator. The Regulations similarly grant compensation for interconnected mini-grid permit holders if a Disco reintegrates the interconnected mini-grid into its network following the expiration of a tripartite contract.<sup>23</sup> Furthermore, to promote transparency and accountability within the financial facets of mini-grid operations, the Regulations mandate a scrutiny and inspection of the accounts of mini-grid operators. Operators are required to furnish reports to the Commission in the specified format, either individually for each mini-grid or as a consolidated report for a collection of mini-grids at least once a year.<sup>24</sup>

The Mini-Grid Regulations, 2023, indeed reflect a strategic and forward-thinking approach to expanding the nation's electricity access. Implementation of the Regulations holds promise of significant positive outcomes for the Mini-grid sector. By fostering an environment conducive to private investment and ensuring economic viability, the Regulations can facilitate the growth of the mini-grid sector as well as improve electricity access nationwide and economic development in the country.

### **Conclusion:**

The decentralized nature and reliability of mini-grids indeed make them the ideal catalyst to address Nigeria's persistent electricity problems and abysmal power supply. The Mini-Grid Regulations, 2023, which is flexible, scalable, progressive, and forward-thinking, and promote financial viability, provide a solid legal framework for the development and operation of mini-grids, fostering investor confidence in the sector and accelerating the pace of electrification in the country, particularly in rural, unserved, and underserved areas.

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<sup>22</sup> Section 8 of the Mini-Grid Regulations, 2023.

<sup>23</sup> Section 9 of the Mini-Grid Regulations, 2023.

<sup>24</sup> Section 13(2) of the Mini-Grid Regulations, 2023.