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CORPORATE CLEAN ENERGY PROCUREMENT IN NIGERIA

MARKET AND POLICY STATUS REPORT

APRIL 2024

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PURPOSE

This study aims to deepen the understanding of the market for corporate clean energy procurement in Nigeria, establish a knowledge base, and begin building awareness among corporate energy customers, policymakers, and other ecosystem stakeholders. This report provides an overview of the latest market and policy status and identifies key challenges and opportunities to accelerate corporate energy transition in Nigeria.

AUDIENCE

The primary intended audience of this report is corporate energy customers, especially those with operations in Nigeria. This report can also be a valuable resource for renewable energy developers, policymakers, utilities, financiers, and development partners who are involved in advancing clean energy projects in Nigeria and other developing countries.

ABOUT THE CLEAN ENERGY BUYERS ASSOCIATION

The Clean Energy Buyers Association (CEBA) activates a community of energy customers and partners to deploy market and policy solutions for a carbon-free energy system. CEBA's aspiration is to achieve a 90% carbon-free US electricity system by 2030 and cultivate a global community of customers driving clean energy.

To join CEBA or learn more about the organizations participating in the CEBA community, visit www.cebuyers.org.

ABOUT THE CLEAN ENERGY BUYERS INSTITUTE

The Clean Energy Buyers Institute (CEBI) is a nonprofit organization focused on solving the toughest market and policy barriers to achieving a carbon-free energy system in collaboration with policymakers, leading philanthropies, and energy market stakeholders.

ABOUT RMI

RMI is an independent nonprofit founded in 1982 that transforms global energy systems through market-driven solutions to align with a 1.5°C future and secure a clean, prosperous, zero-carbon future for all. We work in the world's most critical geographies and engage businesses, policymakers, communities, and nongovernmental organizations to identify and scale energy system interventions that will cut greenhouse gas emissions by at least 50 percent by 2030. RMI has offices in Basalt and Boulder, Colorado; New York City; Oakland, California; Washington, D.C.; and Beijing.

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GLOSSARY

AEDC	Abuja Electricity Distribution Company
AFD	Agence Française de Développement
ATC&C	Aggregated Technical Commercial and Collection
DART	Demand Aggregation for Renewable Technology
DER	Distributed Energy Resource
DisCo	Distribution Company
ECN	Energy Commission of Nigeria
EPC	Engineering, Procurement, and Construction
ETO	Energy Transition Office
ETP	Energy Transition Plan
FCMB	First City Monument Bank
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GVE	Green Village Electricity
IEDN	Independent Electricity Distribution Networks
IFC	International Finance Corporation
IPP	Independent Power Producer
IRENA	International Renewable Energy Agency
MPDC	Manufacturer Power Development Company
MYTO	Multi-Year Tariff Order
NBC	Nigerian Bottling Company
NBET	Nigerian Bulk Electricity Trading Plc
NDC	Nationally Determined Contribution
NERC	Nigerian Electricity Regulatory Commission
NESI	Nigerian Electricity Supply Industry
NREAP	National Renewable Energy Action Plan
NSIA	Nigeria Sovereign Investment Authority
PaaS	Power-as-a-Service
PPA	Power Purchase Agreement

PV	Photovoltaic
REC	Renewable Energy Certificate
REG	Renewable Embedded Generation
RIPLE	Renewables Investment Platform for Limitless Energy
SaaS	Solar-as-a-Service
SEforAll	Sustainable Energy for All
SMEs	Small and Medium Enterprises
SUNREF	Sustainable Use of Natural Resources and Energy Finance
TCN	Transmission Company of Nigeria

EXECUTIVE SUMMARY

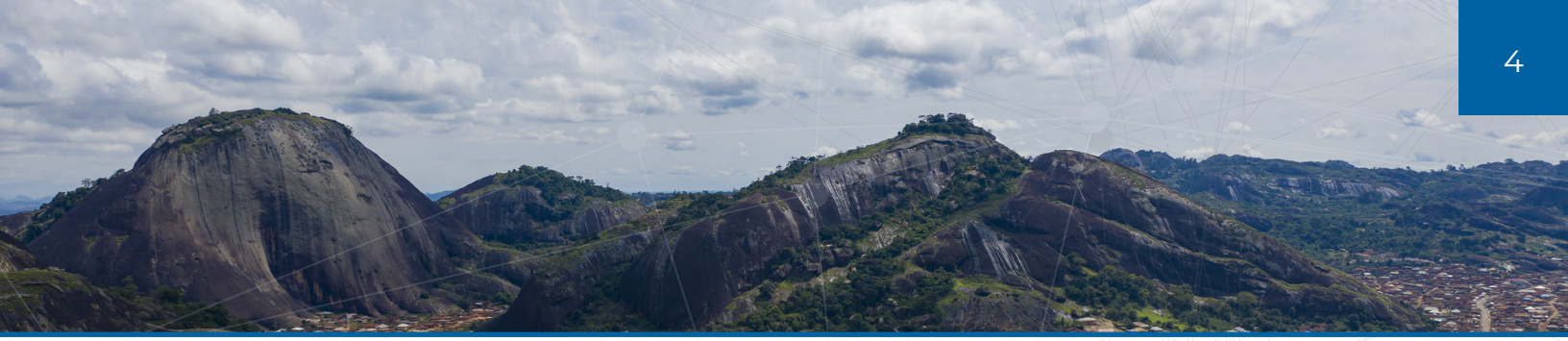
Nigeria is on the cusp of a clean energy transition, having committed to carbon neutrality by 2060 and possessing a maturing distributed energy resources (DERs) industry. To reach a tipping point that would accelerate its clean energy transition, Nigerian stakeholders would benefit from further innovation in business models and a more enabling policy environment.

Commercial and industrial energy customers are at the forefront of this development, with an unmet need for reliable, affordable, and efficient power. Currently, most commercial and industrial customers are underserved by the bulk grid and must resort to fossil fuel-powered self-generation of electricity. With increasing fuel costs and growing corporate interests in clean energy, companies need solutions. Yet the market for corporate clean energy procurement and the business models to support it are still nascent in Nigeria.

Renewable energy is viewed as a critical element in strengthening the power sector, but policy and regulatory gaps exist.[i]

- Despite being the largest economy in sub-Saharan Africa both in terms of population and gross domestic product (GDP), Nigeria's power sector lags behind South Africa's and Ghana's.
- The sector is severely challenged by the lack of generation capacity, poor transmission, and distribution infrastructure. It is estimated that only 19% of the load on grid is met, and as a result, businesses and households must rely on expensive diesel generators for their power needs.
- Nigeria has an abundance of untapped renewable energy resources. Solar photovoltaic (PV) alone, with a conservative technical potential estimated at 210 GW, can meet Nigeria's total current electricity demand of about 40 GW.[1] Solar deployment, especially off-grid, has been growing strongly since 2016, with a compound annual growth rate of 22% for installed PV capacity.[2]
- The Federal Government of Nigeria is liberalizing the power sector and prioritizing the expansion of generation, transmission, and distribution capacity, as well as positioning renewable energy to play key roles in meeting the country's climate goals and energy transition.
- There are policies and national plans that call out installed capacity targets and/or energy mix targets for renewables. One example is the Nigeria Energy Transition Plan (ETP), which lays out a guide for the energy transition and aims to achieve 6.3 GW of decentralized renewables to replace off-grid diesel generation by 2030. However, these policies have not been unified nor binding. The implementation of these policies and plans also faces many challenges, including slow grid infrastructure upgrades, utility pushback, and misalignment among responsible parties.
- While Nigeria has made encouraging progress in improving regulatory frameworks to support renewable project development, there is a need for policies that send stronger market signals and stimulate growth, such as:
    - Clear renewable target
    - Renewable purchase mandates
    - Tax and fiscal incentives
    - Streamlined regulatory process for project licensing
    - Cost-reflective tariffs for on-grid electricity

i In this report, we use "clean energy" and "renewable energy" interchangeably.



Various clean energy procurement options already exist, and more options are emerging.

- On-site solutions are most prevalent in Nigeria today, with various business models (such as direct investment and power-as-a-service [PaaS]) ready for commercial and industrial customers to deploy right away.
- On-site pilot projects on more innovative utility-enabled models are in progress.
- Off-site solutions, including off-site power purchase agreements (PPAs), are possible but limited to one-off projects so far.
- Utility programs such as green tariffs are not yet available in Nigeria; neither are energy attribute certificates and other voluntary clean energy markets.

Several challenges thwart the deployment of clean energy projects.

Through research and extensive stakeholder consultation, we grouped key challenges for corporate clean energy procurement under four themes:

1. Awareness and knowledge gaps among customers and developers
2. Lack of regulatory clarity and incentives
3. Perceived cost premium of renewables and financing risks
4. Fragmented ecosystem and underdeveloped stakeholder network

We recommend a set of actions and measures to address the key challenges, unlocking the market potential for corporate clean energy procurement.

- To fill the awareness and knowledge gaps, **forming a cohort of corporate energy customers** and building awareness through regular convenings and training events is essential. **A "one-stop shop"** can be established to support and equip interested energy customers to pursue the right project.
- To set clear market signals with policies, the Ministry of Power, Ministry of Finance, the Energy Transition Office, and the Nigerian Electricity Regulatory Commission should take proactive measures on the Electricity Act 2023 and Nigeria's ETP. This would enable them to **develop clear and binding renewable targets, mandates, and incentives**.
- To enable affordable and long-term financing, **de-risking clean energy projects** to boost investor confidence is needed. Leveraging policy, grant, and concessional support to bridge the financing gaps can address financial risk in the near term.
- To foster collaboration and partnerships, ecosystem stakeholders should prioritize **creating ample opportunities** for corporations, developers, financiers, policymakers, and utilities to **connect, share, and learn**.

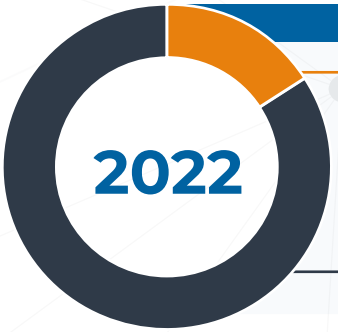
THE POWER SECTOR IN NIGERIA

Nigeria is the largest economy in sub-Saharan Africa, with a population of over 200 million. In 2022, Nigeria had a GDP of about US$470 billion, and the economy is expected to grow at an average rate of 3.4% between 2023 and 2025.[3] The industry sector contributes about 18% of Nigeria's real GDP, with the agriculture sector accounting for about 27% and the service sector for about 55%.[4] Oil plays a key role in the economy, and Nigeria is trying to decrease this dependency. The contribution to GDP from oil decreased from 9.25% in Q1 2021 to 5.48% in Q3 2023.[5] Still, oil and gas account for the majority of Nigeria's export and government revenue.

Expanding and improving power supply are critical to enable development and economic growth in the nation, yet the Nigerian power sector is lagging. Only 60% of Nigerians (89% of the urban population and 26% of the rural population) have access to electricity.[6] The annual per capita power consumption is only 144 kWh compared with 351 kWh in Ghana and more than 4,000 kWh in South Africa.[7]

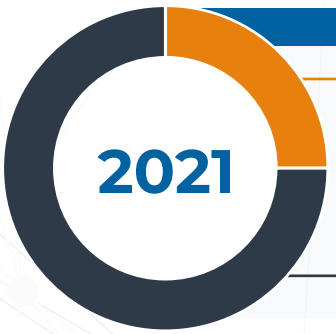
The power sector in Nigeria faces many broad challenges such as regulatory and market uncertainties, technical limitations, and planning constraints, but Nigeria's power supply is most significantly impacted by the lack of generation capacity and poor, insufficient transmission and distribution infrastructure. The country's electricity demand is estimated at 40 GW, driven by commercial and industrial activities, yet the 23 grid-connected generating plants have a total installed generation capacity of about 13 GW — more than 80% of which comes from natural gas and 16% from hydropower (Exhibit 1, top).[8] On the other hand, the average generation available for hourly dispatch is merely about 4 GW and total on-grid generation is only about 36,640 GWh, almost all from natural gas and hydropower (Exhibit 1, bottom).[9] It is estimated that only 19% of the suppressed load on grid is met.[10]

Exhibit 1. On-grid installed capacity in 2022 and electricity generation mix in 2021



ON-GRID INSTALLED CAPACITY IN 2022

16%	Hydro	**2,110.4 MW**
0%	Solar	9.7 MW
0%	Solid Biofuels	12.0 MW
0%	Oil	28.0 MW
84%	Natural Gas	**10,967.5 MW**



ON-GRID ELECTRICITY GENERATION IN 2021

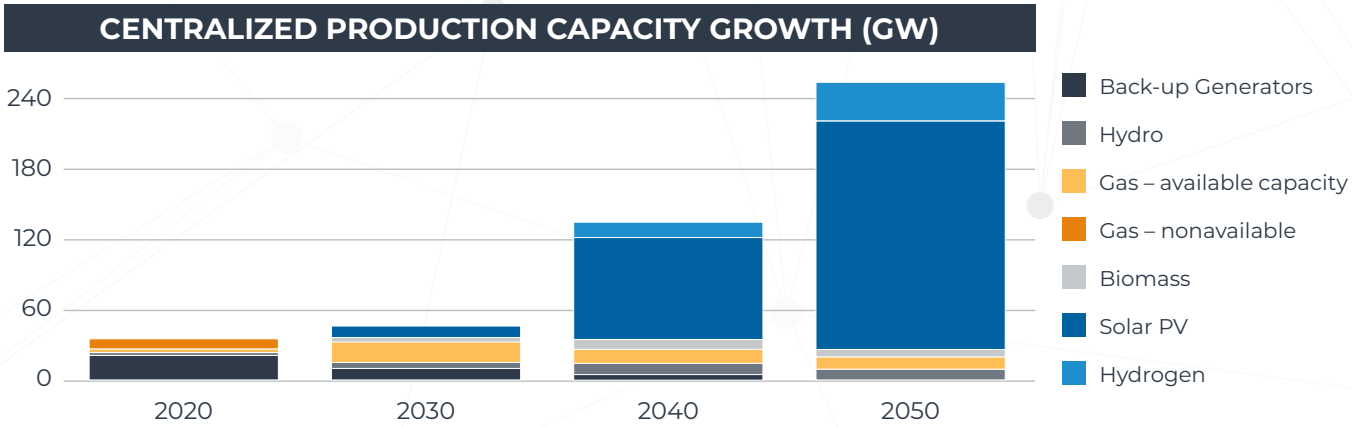
25%	Hydro	**9,157.7 GWh**
0%	Solar	8.5 GWh
0%	Solid Biofuels	34.8 GWh
0%	Oil	12.1 GWh
75%	Natural Gas	**27,427.8 GWh**

Source: IRENA

Due to the severely constrained supply and unreliable grid infrastructure and service (even in central districts in Abuja, Port Harcourt, Kano, and Lagos), businesses and households experience multiple blackouts on most days. Consequently, many of them resort to expensive captive diesel generation to meet their power needs. Off-grid diesel/petrol generators emitted about 5.8 million metric tons of carbon dioxide in 2020, accounting for 3.2% of Nigeria's in-scope emissions.[ii]

The Federal Government of Nigeria has set objectives and strategies to strengthen the power sector. In the National Development Plan 2021–2025, key objectives for the power sector include increasing transmission capacity and the amount of energy on distribution networks to 10 GW by 2025 while reducing transmission and distribution losses, and expanding on-grid generation capacity to 25 GW.[11] Nigeria further targets universal energy access and 42 GW of operational grid capacity by 2030, as well as replacing 100% of the diesel generators by 2050 in the ETP.[12]

Exhibit 2. Nigeria generation capacity growth target under ETP



Source: ETP

NIGERIA'S CLIMATE AND CLEAN ENERGY GOALS

In July 2021, Nigeria submitted its updated nationally determined contribution (NDC) to the United Nations Framework Convention on Climate Change. In the updated NDC, Nigeria pledged 20% unconditional emissions reduction by 2030 compared to business as usual, and raised its emission reduction target to 47% (from 45%) on the condition of international support, which is consistent with a global 1.5°C pathway.[13] Later in the same year, during COP26, Nigeria committed to carbon neutrality by 2060.

Nigeria has abundant untapped renewable energy resources, including solar, hydro, wind, and biomass. For example, annual global horizontal irradiation can reach over 2,000 kWh/m^2 in the northern part of the country, demonstrating enormous solar energy potential. The International Renewable Energy Agency (IRENA) estimates the technical potential for solar PV in Nigeria at 210 GW, for concentrated solar power at 89 GW, and for wind at 3 GW, with a very conservative consideration that only 1% of the suitable land can be used for project development.[14] Nigeria also has the potential for approximately 24 GW of large hydro and 3.5 GW of small hydro, most of which remains unexploited.[15]

ii The estimates are based on data from the ETP, which show the power sector emitted 48 million metric tons of carbon dioxide in 2020, which represents about 27% of the in-scope emission in Nigeria, and off-grid diesel/petrol generator usage accounts for 12% of power sector emission. https://www.energytransition.gov.ng/power/

Nigeria has already been on a long journey to pursue clean energy and has several policies and plans in place:

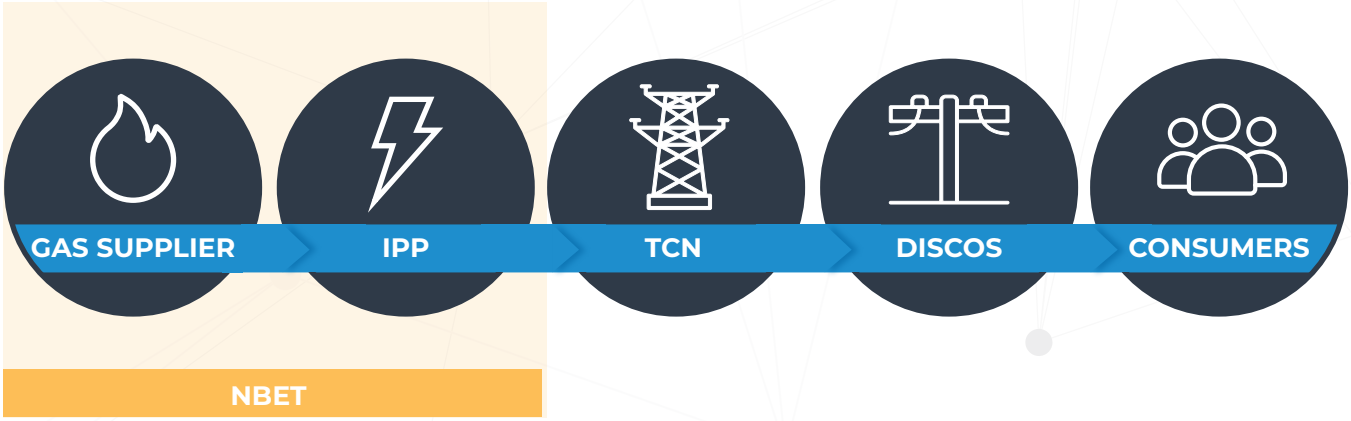
- **National Renewable Energy and Energy Efficiency Policy, 2015:** This policy was a blueprint for Nigeria to harness renewable energy and energy efficiency in driving sustainable development of the power sector. It named solar as a priority for on-grid power supply, with the goal of 3% solar in the total energy mix by 2020 (not met) and 6% by 2030.
- **National Renewable Energy Action Plans (NREAPs) (2015–2030):** The NREAP was developed by Sustainable Energy for All (SEforAll) and later adopted by the Inter-Ministerial Committee on Renewable Energy and Energy Efficiency. The plans present the expected development and expansion of renewable energy in Nigeria and suggest achievable renewable targets. They set targets of grid-connected renewable installed capacity (excluding medium and large hydro) at 2.8 GW by 2020 (not met) and 9.1 GW by 2030, and the renewable energy share (excluding medium and large hydro) of electricity generation mix at 13% by 2020 (not met) and 15% by 2030.
- **National Development Plan 2021–2025:** The plan highlights renewable energy targets of 1.1 GW on-grid capacity through the 14 solar independent power producers (IPPs) that have existing licenses and agreements with the Nigerian Bulk Electricity Trading Plc (NBET), plus 0.5 GW off-grid solar by 2025.
- **Nigeria Energy Transition Plan (ETP), 2021:** The ETP lays out a roadmap to guide the energy transition effort while meeting the nation's energy needs across sectors. The ETP aims to achieve 6.3 GW of decentralized renewables to replace off-grid diesel generation by 2030, 197 GW of solar capacity installed by 2050, and 250 GW by 2060.

While there is clear interest in developing clean energy, targets from various policies and plans are not unified or enforced. There are gaps in setting such targets with more granular timelines (such as year by year) and accountability (such as specifying agencies to lead the implementation). Transmission and distribution companies also don't have clear mandates or guidance to incorporate more renewables into the energy mix.

POLICY AND REGULATORY LANDSCAPE

The Nigerian Electricity Supply Industry (NESI) is primarily made up of generation companies (mostly gas suppliers and IPPs), the Transmission Company of Nigeria (TCN), 11 distribution companies (DisCos), and consumers, with NBET functioning as the bulk energy customer and wholesaler of electricity (Exhibit 3).

Exhibit 3. NESI Value Chain



Source: NBET

The Nigerian power sector has been undergoing an ambitious three-phase reform since the early 2000s, with the end goal of achieving a fully deregulated and competitive power market.[iii] In the first phase of the reform, Nigeria unbundled the long-lasting monopoly power company. The Federal Government now retains ownership of transmission networks and assets, and privatized some generation and all distribution companies under various share sale agreements with new owners. The Nigerian Electricity Regulatory Commission (NERC) was established as an independent power sector regulator by the Electric Power Sector Reform Act of 2005, to carry out technical and economic regulations of NESI. Now, at the beginning of the second phase of the reform, the focus is on implementing cost-reflective retail electricity tariffs and attracting private sector investment in the NESI value chain to begin developing a competitive national electricity market.[16,17]

Corporate clean energy procurement aligns well with Nigeria's priorities to encourage private sector investment in the power sector and to deploy clean energy at scale. With guidance from policymakers in Nigeria, we reviewed policies and regulatory frameworks that are most relevant for clean energy projects. In this section, we summarize existing policies (in chronological order by publication year) and discuss how they apply to corporate clean energy procurement.

The Electricity Act, 2023: The Electricity Act is the second phase of the power sector reform — after the Electric Power Sector Reform Act of 2005 — to liberalize the electricity market in Nigeria. The Electricity Act consolidates laws relating to NESI and aims to provide a comprehensive framework for the power sector in Nigeria and attract private sector investment. It includes provisions related to licensing for electricity generation, distribution, and transmission, as well as offenses, penalties, land acquisition, consumer protection, renewable energy and rural electrification, and tariffs and subsidies.

iii The three electricity market stages are referred to as the Transitional, the Medium-Term, and the Long-Term Electricity Market.

The Electricity Act is the overarching and guiding policy for the power sector. The act explicitly states that NERC is to "promote the development and utilization of renewable energy services and increase the contribution of renewable energy to Nigeria's energy mix."[18] NERC is required to put in place regulatory measures to stimulate renewable deployment, which will create a more enabling environment for corporate clean energy procurement when implemented. These measures include establishing power-source-specific waivers and subsidies, enforcing renewable purchase obligations, ensuring stable and long-term favorable pricing mechanisms for renewable energy, and issuing guidelines on net-metering. The act also urges the Ministry of Finance to introduce tax incentives or other fiscal policy frameworks to promote and facilitate the generation and consumption of energy from renewable sources.

While the Electricity Act paves the way for many opportunities that would facilitate a clean energy transition, several details and implementation plans remain unclear at this stage. It is expected that the Federal and state governments will engage stakeholders through various avenues (like workshops and town halls) on the plan to implement the act. NERC is also expected to amend regulations and introduce guidelines as called out in the act to support implementation. Hence, the regulator is highly interested in reviewing innovative solutions and finding ways to leverage existing regulatory instruments.

Mini-Grid Regulation, 2023: First published in 2016, this regulation creates a framework for establishing and operating mini grids of up to 1 MW with the key objective to accelerate electrification of unserved rural and underserved peri-urban areas. The regulation is recognized as a critical piece of the regulatory landscape for Nigeria's renewable energy development. While it is most applicable for rural electrification projects, we learned through engagement with policymakers (including NERC) that it can also be leveraged for business models, such as the commercial street model (See page 23, Off-site Options), to bring renewable solutions to the commercial and industrial sector. Several developers are exploring interconnected mini grids to strengthen the grid and provide improved service to end users. In the 2023 version, NERC made key updates, allowing developers to submit applications for a portfolio of projects and expanding the definition of community,[iv] positioning it to apply to more projects beyond rural electrification.

iv Community is now defined as "a group of people within the same geographical location organized under a recognized local leadership structure or a legal recognized corporate entity and in both cases capable of entering contracts and being capable of suing and being sued."

Eligible Customer Regulation, 2017: The regulation permits generation companies to bypass the wholesale market and DisCos to sell electricity directly to "eligible customers." The Minister of Power declared four categories of eligible customers so far, and a main criterion is a customer or a group of customers that consume more than 2 MWh/month, which directly covers the commercial and industrial sector. This regulation opens the door for large corporate energy customers to enter bilateral agreements with generation companies and receive electricity directly from TCN. However, to ensure the proper implementation, NERC set out various criteria and conditions when approving customer requests to become eligible customers. Roughly a dozen agreements have been signed under this regulation. However, as these are very big consumers who are key components in current DisCo tariff design, the main concern is that taking significant consumption away from the distribution networks can distort the DisCo tariff. NERC continues to evaluate the best way to protect DisCos' interests while encouraging competition with bilateral agreements between customers and generation companies.

Regulations on Feed-In Tariff (REFIT) for Renewable Energy, 2015: REFIT was introduced as a measure to diversify Nigeria's on-grid energy mix. It provides a special tariff framework for renewables in the form of fixed feed-in tariffs (subject to periodic NERC reviews) to attract private investment. Wind, small hydro, biomass, and solar projects are eligible under REFIT. One of the drivers of putting the policy in place was to facilitate grid integration of solar IPPs. Due to a funding constraint, the 14 solar IPPs signed in 2016 did not reach close, and the implementation of REFIT has not been successful.[19] NERC is working on revamping the policy and conducting technical and financial evaluations of the projects. We expect an updated version of REFIT to be released this year. For corporate customers, the successful implementation of feed-in tariffs could unlock access to more clean energy through utility offerings, as the tariffs encourage renewable integration.

Embedded Generation Regulations, 2012: This legislation provides standard rules, licensing, and operating fees for embedded generation and distribution of electricity. Embedded generation is defined as the generation of electricity that is directly connected to a distribution system, rather than at the transmission level. It provides major opportunities for large-scale renewable projects at the distribution level to improve customer supply. So far, few thermal plants have been deployed using the legislation.

A key challenge for embedded generation developers is ensuring payment from the DisCo, whose accounts are escrowed by the regulator. Combined with the non-cost-reflective DisCo tariffs and high technical commercial and collection losses, embedded generation was not attractive to developers and investors until the recent introduction of the Renewable Embedded Generation (REG) business model (See page 23, Off-site Options). This model addresses the above concerns and has enabled the regulator to provide a guideline for developers and DisCos to set up separate accounts to guarantee developer revenues and facilitate the implementation of the REG leveraging the legislation. It may also apply to mini grids or similar power systems above the 1 MW limit in the Mini-Grid Regulation, per NERC guidance.

Independent Electricity Distribution Networks (IEDNs), 2012: This regulation provides standard rules for issuing distribution licenses to qualified operators and licensees to engage in electricity distribution independent of the distributed system operated by the DisCos. With this regulation, developers can build IEDNs to serve their customers, which opens the door for off-site solutions.

License and Operating Fees Regulation, 2010: The regulation specifies the licensing and operating fees for generation (which is based on capacity), transmission, system operations, distribution, and trading. Under the regulation, licensing and regulatory approval is required for generation systems above 1 MW, with a US dollar-denominated license fee and an operating fee of 1.5% of the licensee's per kWh charge. This has discouraged developers and customers from pursuing projects above 1 MW. We found that developers today often cap projects at 999 kW or develop multiple systems at one site as a workaround to avoid the regulatory process.

Permits for Captive Power Generation Regulations, 2008: These regulations define captive power generation as the generation of electricity exceeding 1 MW for the purpose of consumption by only the generator and not sold to a third party. These regulations provide detailed requirements for permit application and the regulatory process. Many commercial and industrial customers in Nigeria already use captive power generation (or self-generation) solutions for more consistent electricity supply to their operations. These regulations will apply to corporations interested in directly investing in on-site clean energy solutions for self-consumption.

KEY POLICY AND REGULATORY RECOMMENDATIONS AND DEVELOPMENTS

Over the last decade, Nigeria has made some encouraging progress in improving the regulatory frameworks to strengthen the power sector and more recently to support a clean energy transition. Many developers, financiers, and development partners recognize the efforts. The consensus among them is that the policies and regulations aren't restrictive, which makes various clean energy projects possible in theory. In reality, the implementation of policies and regulations face many challenges, including slow grid infrastructure upgrades, utility pushback, and sometimes misalignment among responsible parties. The policy and regulatory environment needs to be further strengthened to enable deployment of renewable solutions at scale, and to send more positive and clearer signals to boost customer, developer, and investor confidence. Exhibit 4 summarizes policy and regulatory recommendations to address the gaps identified through the study.

Exhibit 4. Recommendations on addressing policy and regulatory gaps from RMI assessment

TYPE	POLICY AND REGULATORY RECOMMENDATIONS
Targets	• Unified and binding national-level and state-level clean energy targets, ideally with more granular timelines • Harmonized clean energy development plans and roadmaps from various studies
Mandates	• Mandates for clean energy in the on-grid energy mix • Renewable purchase mandates for utilities and certain customers
Regulation Market Rules	• Revamped feed-in tariff regulation • Electricity dispatch rules that will encourage the integration of more clean energy • Voluntary Energy Attribute Certificate markets
Implementation Plan and Guide	• Implementation plan and timeline following the Electricity Act, 2023 • Implementation plan for cost-reflective electricity tariff through the Multi-Year Tariff Order (MYTO)[v] • Step-by-step guide for the licensing process for clean energy projects
Incentives	• Tax and fiscal incentives to promote the development and consumption of clean energy

v MYTO is a tariff model used to set wholesale and retail prices of electricity in Nigeria.

Policymakers have begun addressing policy gaps, as the Government is interested in improving the regulatory environment. Development agencies and their local stakeholders are eager to support policy reform. Overall, the Nigerian Government is still in an exploration phase to understand the impact of adding more clean generation sources to the energy mix, and a key priority is to ensure grid revenue. Policymakers are interested in getting support on studies that can inform the design of fiscal incentives for clean energy. Below are some ongoing efforts worth noting and monitoring, which we learned through stakeholder consultation.

On setting clean energy targets and mandates:

- The Ministry of Power is working on setting DisCo-level renewable targets through an integrated resource planning study.
- NERC is considering renewable energy purchase obligations for DisCos and eventually end consumers.

On policies further enabling clean energy integration:

- NERC is in the process of updating the feed-in tariff regulations and working on renewable priority dispatch rules.
- The Energy Transition Office (ETO) is leading a study documenting diesel genset usage in Lagos State. Results and insights of the study will inform the design of programs to incentivize replacing gensets with clean solutions.
- Lagos State is drafting state-level electricity legislation that will encourage net-metering.
- The Energy Commission of Nigeria (ECN) is promoting the development of wind energy as an alternative energy solution in northern states in Nigeria in collaboration with the Global Wind Energy Council. Research and analysis on wind power development will kick off with Niger State.

STAKEHOLDER LANDSCAPE

Beyond commercial and industrial energy customers, we identified five main categories of stakeholders who play active roles in supporting renewable development and the clean energy transition in Nigeria as it relates to the commercial and industrial sector (Exhibit 5).

Key **policymakers** include the following:

- **The ETO,** which functions through the Office of the Vice President and is leading Nigeria's ETP effort
- **The Ministry of Environment,** which guides the nation's strategy on climate change and ensures effective coordination of environmental matters
- **The Ministry of Power,** which acts as the policy arm of the Federal Government for the power sector and leads sector reform
- **The ECN,** whose mandates include overall energy sector planning and policy implementation
- **NERC** as the independent energy market regulator
- **The Ministry of Finance,** which puts forward fiscal incentives and regulates the financial sector

Developers are increasingly prioritizing commercial and industrial projects as market interest grows. Daystar Power, Starsight Energy, Havenhill, Arnergy, Westa Solar, and CrossBoundary Energy are some of the active developers. Given the nascent stage of the market, most developers still rely on grant funding and concessional financing. From information we gathered, Daystar and Starsight are the only two developers in Nigeria who began to use their own equity to finance projects.

Leading **financiers** providing financing facility and products for renewable projects include Empower New Energy, Cygnum Capital (formerly Lion's Head Group), Bank of Industry (BOI), Sterling Bank, Access Bank, and First City Monument Bank (FCMB), as well as **development partners**. International Finance Corporation (IFC), the World Bank, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Agence Française de Développement (AFD), for example, are providing technical assistance to policymakers, and funding and implementing programs to promote wide commercial adoption of renewable energy, along with their partnering organizations such as SEforAll and Net Zero World.[vi] (See more in *Existing Initiatives and Programs*.)

The "**enablers**" are actors and programs that can strengthen market linkage and facilitate corporate clean energy access. Some may offer procurement options and financing solutions, and some advocate for diesel genset replacement and encourage energy customers and developers to interact with each other. The enablers include utilities (who would act to allow more reliable and clean grid supply), the marketplace, and platforms that are designed to originate and facilitate transactions (such as SunFi[vii]) and offer financing solutions (like Imperium[viii] and Ecoligo[ix]), as well as trade associations and organizations (like Manufacturers Power Development Company[x]).

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vi Net Zero World is an initiative led by the US National Renewable Energy Laboratory.

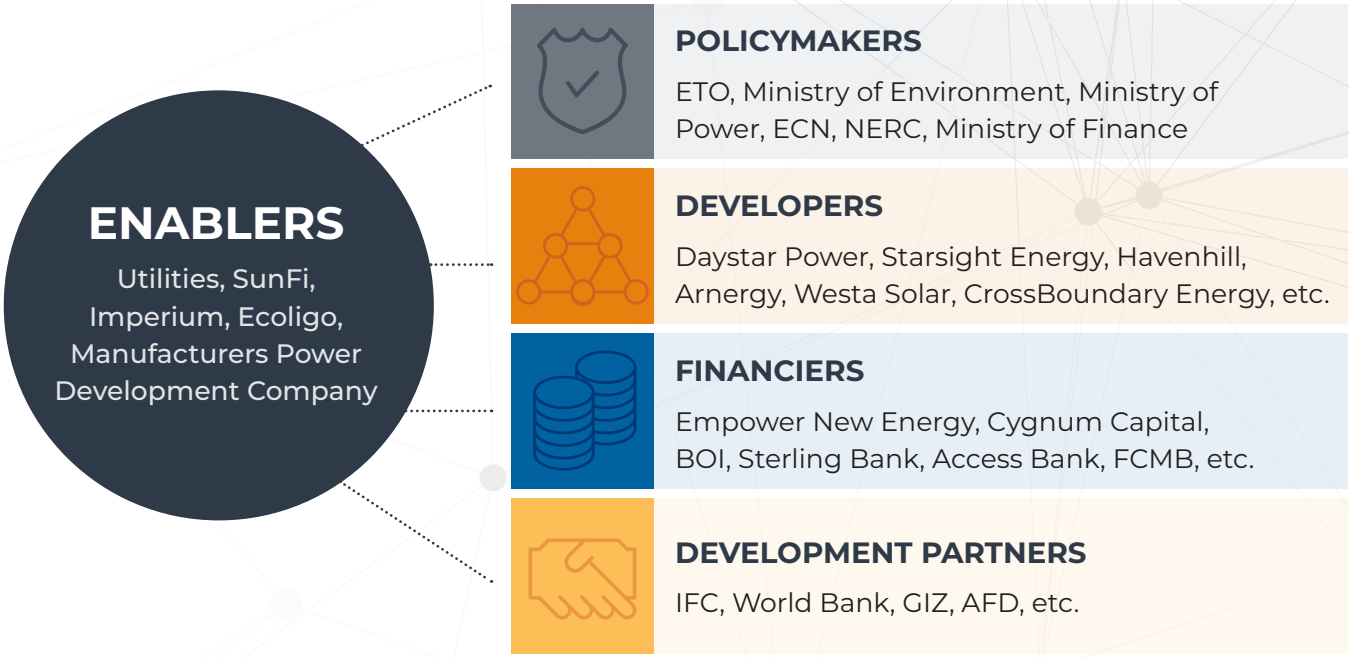
vii SunFi is a managed solar marketplace that originates projects by working with commercial and retail entities to access clean energy solutions. The platform also vets all providers that can support the development of clean solutions.

viii A product of Sterling Bank, Imperium is a digital marketplace with solar financing options for buyers.

ix Ecoligo offers crowd investment for solar projects.

x Set up by the Manufacturers Association of Nigeria, the company facilitates clean energy deals for industrial members.

Exhibit 5. Stakeholder landscape for corporate clean energy procurement in Nigeria



RMI engaged at least three stakeholders across each category to collect their perspectives regarding the status of the clean energy market, as well as challenges and opportunities to support the scaling of corporate procurement. We also asked specific questions to understand the bottlenecks, regulatory gaps, and potential interventions that can further drive corporations' access to clean energy at scale.

EXISTING INITIATIVES AND PROGRAMS

Through engagement, RMI identified ongoing initiatives and programs in Nigeria that could assist in scaling corporate clean energy procurement. This exercise also helped us determine suitable approaches to implement interventions capable of addressing various concerns identified by stakeholders (see page 28, Recommendations).

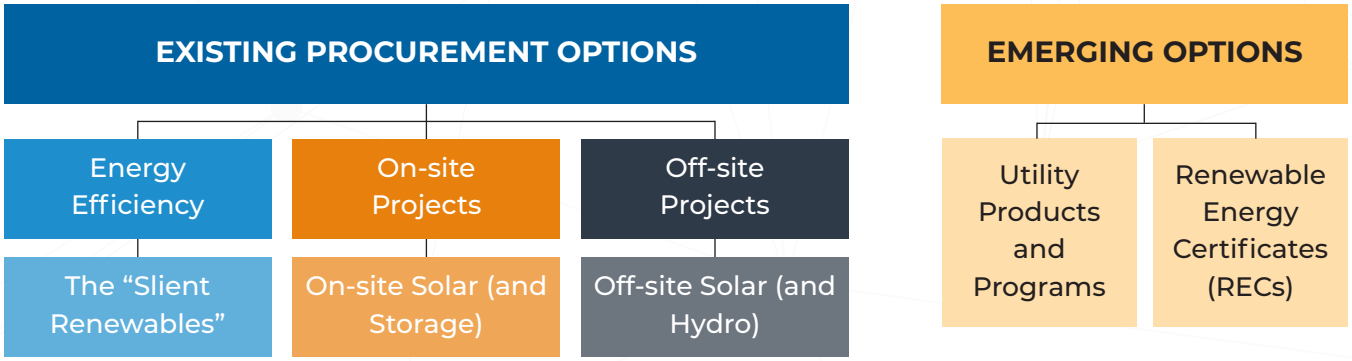
- **Project Development Program Mission by GIZ:** The program supports the energy transition of local industrial and commercial end-users. Nigeria is one of the recipients of the German Energy Solution Initiatives that aim to facilitate business partnerships between end users and experienced German service providers in the field of solar PV.
- **Sustainable Use of Natural Resources and Energy Finance (SUNREF):** Funded by AFD, SUNREF provides long-term, low interest financing to local commercial banks for on-lending to renewable energy projects across Africa. Phase 1 of SUNREF in Nigeria is now closed and did not gain enough traction. AFD secured €100 million and is now revamping the effort in partnership with BOI, which already has experience setting up schemes offering lower interest debt financing to support corporations in Nigeria.

- **Nigeria Sovereign Investment Authority (NSIA) – Renewables Investment Platform for Limitless Energy (RIPLE):** RIPLE is a $US500 million transformation initiative focused on developing, investing in, and operating renewable energy projects across the entire value chain. NSIA has partnered with the IFC to advance the transition to energy-efficient solutions and ensure the development of innovative energy solutions that will deliver reliable power supply and optimize productivity to commercial and industrial users.
- **The Solar Marketplace led by the Kingdom of the Netherlands:** The Solar Marketplace was launched in November 2023 and aims to connect business opportunities and stakeholders within Nigeria's solar energy sector. The marketplace will focus on catalyzing the country's expansion concerning solar solutions by facilitating networking among influential public and private stakeholders and bridging the gap between solar industry players, customers, investors, cutting-edge technology, and sector experts. Its key objective is to advocate for favorable solar energy policies and regulatory frameworks to boost market growth.
- **Manufacturer Power Development Company (MPDC):** MPDC is a special purpose vehicle set up by the Manufacturers Association of Nigeria to support its members in determining the best way to access reliable energy solutions. MPDC has over 3,000 members and is interested in partnership and collaboration with entities that will support the clean energy transition and improve energy efficiency for their members. One goal of MPDC is to facilitate the implementation of suitable energy solutions for their members, allowing the companies to focus on their core business.

CORPORATE PROCUREMENT OPTIONS AND CONSIDERATIONS

Over the last few years, more businesses in Nigeria have recognized the importance of clean energy projects as the price of diesel keeps increasing. Many businesses relying heavily on diesel self-generation are eager to find alternative energy solutions to reduce their energy costs and dependence on fossil fuels. Also driven by corporate sustainability goals, companies in Nigeria are already taking action. Through our study, we identified and mapped out the options for corporations to access clean energy in Nigeria. Exhibit 6 provides a summary.

Exhibit 6. Summary of existing and emerging corporate clean energy procurement options in Nigeria



Energy efficiency is commonly referred to as the "silent renewable," as it can reduce unnecessary energy demand, leading to energy cost savings and requiring reduced clean energy investments. In Nigeria, energy efficiency has not been a priority for businesses so far. Some have taken measures such as more efficient lighting, but the impacts are rather limited. In this report, we focus on discussing the on-site and off-site project options.

For on-site projects, various business models are readily available for companies to apply right away, although some models are in the pilot stage and will require additional efforts and coordination with the utility. Off-site options have a lot of potential but are limited to one-off projects so far. Utility products and programs, such as green tariffs and utility subscriptions, are not yet available in Nigeria, mainly due to poor grid infrastructure that cannot ensure the integration and delivery of clean energy to customers.

Currently, an Energy Attribute Credit or Renewable Energy Certificate (REC) market and other voluntary clean energy markets do not exist. There is opportunity for international RECs (iRECs) with the Green Certificate Company as the accredited iREC issuer for Nigeria. To our knowledge, no corporations in Nigeria have used an iREC as a mechanism for accessing clean energy to date.

We evaluated different procurement options and business models based on the following six key considerations, using a rating of one to five, with "one" being lowest and "five" being highest.[xi],[20]

- **Customer Empowerment:** Whether customers can choose how much clean energy to procure based on their own needs and interests
- **Clean Energy Impact:** Whether the option and business model can support new development of clean energy projects, preferably at large scale
- **Project Complexity:** How complex the project design and procurement processes are, which includes the technical requirements and constraints, design and negotiation of contract terms, and administrative and regulatory approval processes
- **Implementation Timeline:** How long it would take to deploy the solution from design to commissioning (this would likely be linked to project complexity). Note that a "one" rating indicates that the option requires the longest time to deploy
- **Price Risk for Customers:** How the procurement affects the customers' energy expenditure, whether procurement prices reflect true clean energy costs and value, and whether customers get locked in or can hedge against future price fluctuations
- **Scalability:** Whether the option and business model can easily scale to more customers and promote more transactions

xi Adapted from REBA Institute, *Renewable Energy Policy Pathways Report*, 2020.

ON-SITE OPTIONS

On-site projects, although often constrained by space availability, are the go-to solutions for corporations and developers, and are most prevalently deployed today in Nigeria. Among on-site options, a few business models are already widely adopted, including direct investment, power- or solar-as-a-service, and lease to own, while innovative utility-enabled business models are being piloted.

1 DIRECT INVESTMENT

In the direct investment business model, corporate energy customers invest in projects directly for self-consumption and own clean energy assets such as solar panels and batteries. Most often, energy customers will tender for a turnkey solution where a selected engineering, procurement, and construction (EPC) contractor will implement and deliver the project. After project commissioning, the EPC contractor should also provide an operation and maintenance manual, then hand the project over to the energy customers, who may manage the on-site systems with their own utility and facility personnel or hire system operators.

Direct investment is one of the most convenient and straightforward ways for clean energy procurement, and the energy customers can have full control over and visibility into the entire process. However, it requires significant up-front capital investment, and few businesses in Nigeria have the necessary financial and administrative capacity.

ADVANTAGES	DISADVANTAGES
• Simple transaction structure and quick to deploy • Transaction process and costs highly visible to energy customers • Limited exposure to foreign exchange risk once payment terms are executed	• Limited impact per transaction • Requires significant up-front capital • Fixed to current premises and constrained by physical space

SPOTLIGHT **STERLING BANK BECOMES AFRICA'S FIRST WITH SOLAR-POWERED HEADQUARTERS**

A leading commercial bank in Nigeria, Sterling Bank is also a leader in demonstrating corporate commitment to mitigating climate change impacts and sustainable growth. On January 1, 2024, the bank announced the full deployment of solar energy at its 17-floor headquarters, the iconic Sterling Towers in the bustling center of Lagos, underscoring the bank's dedication to reducing its ecological footprint and spearheading the adoption of renewable energy within the continent.[21]

Exhibit 7. Sterling Towers before and after BIPV installation *Source*: Onyx Solar

The project adopted building-integrated photovoltaic (BIPV) energy technology, with 3,250 PV glasses covering a total area of 6,500 m^2 and totaling 995 kW of installed solar capacity. This was the largest BIPV project in Africa to date.[22] Sterling expects substantial economic savings in energy costs.

2 PaaS OR SOLAR-AS-A-SERVICE (SaaS)

Since capital cost is a common pain point for energy customers, PaaS and SaaS models have emerged as popular options in Nigeria and have been implemented by a number of domestic and international developers. Under the business model, a developer will design, implement, and operate the clean energy on-site system. Through long-term contracts, similar to PPAs, energy customers pay the developer a monthly fee for power consumption with zero up-front cost. The monthly fee can be a flat lump-sum charge or based on variable per-kWh tariffs. The difference between PaaS and SaaS is the choice of technology:

- In PaaS, a combination of technologies is used, including solar, battery, and backup generators, which can be integrated into the energy customer's existing power supply.
- In SaaS, the developer only provides solar power to the energy customer. Due to high battery costs, which lead to higher monthly payments, the SaaS model is sometimes more attractive, especially for businesses that don't have strict reliability requirements and that view solar as a supplement for diesel generation.

This procurement option is most accessible for businesses with fewer financial resources. In turn, the energy customers have less visibility into the design and operation of the system, as well as the project costs.

ADVANTAGES	DISADVANTAGES
• No up-front costs for energy customers • Simple transaction structure and quick to deploy • More efficient accounting	• Fixed to current premises and constrained by physical space • Project costs less visible to energy customers • Ownership of the asset will not be transferred to the energy customer

SPOTLIGHT NIGERIAN BOTTLING COMPANY (NBC) REDUCES EMISSIONS WITH SOLAR SOLUTIONS

Exhibit 8. Rooftop solar system at NBC Abuja

NBC, a subsidiary of the Coca-Cola Hellenic Bottling Company, has a target of 30% direct carbon emissions reduction compared with 2017 levels, with 50% of its total energy coming from renewables. To pursue its corporate goals, NBC partnered with Daystar Power to implement solar systems to power its operations across Nigeria. So far, Daystar installed over 10 MW of solar at eight NBC factories and has an additional 6 MW in planning.[23] NBC has reduced its use of costly diesel generators, resulting in deep energy cost savings and reduced carbon emissions.

3 LEASE-TO-OWN

In this business model, ownership of the clean energy assets is transferred to the energy customers over a specific contract period. It can be combined with PaaS and SaaS, as the energy customer also pays a monthly fee to the developer. Existing lease-to-own projects are usually small due to the inherent risk with small and medium enterprises (SMEs), and the accounting treatment of such projects are not preferred by large businesses. Nigerian SMEs Chrisllar Global Enterprises, Autocheck, and Bari Motors have installed solar solutions ranging from 10 to 30 kW (some with batteries) to support their business operations and to shield the impact from diesel price escalations and an unreliable grid.

ADVANTAGES

- No up-front cost for energy customers
- Simple transaction structure and quick to deploy
- Ownership of the assets will be transferred to the energy customer

DISADVANTAGES

- Limited impact per transaction
- Fixed to current premises and constrained by physical space

4 UTILITY-ENABLED COMMERCIAL AND INDUSTRIAL

The utility-enabled commercial and industrial model leverages the reliability benefits of DERs and affordable on-grid electricity supply to better serve commercial and industrial customers. The developer and DisCo share the responsibility to supply power to the energy customer with respective priority hours through a tripartite agreement and blended electricity tariff. The developer is responsible for installing and managing the on-site solar system to supply power during daytime peak hours. The developer will also work with the DisCo to improve the distribution network to ensure reliability. The business model can create a win-win-win scenario: The customer receives highly reliable power at a cheaper price, the developer attracts customers who otherwise cannot afford renewable-only solutions, and the DisCo gains additional revenue and rebuilds customer trust.

ADVANTAGES

- No up-front costs for energy customer
- Blend in cheaper on-grid supply
- More efficient accounting

DISADVANTAGES

- Possibly constrained by physical space (depending on the size of operation)
- Project costs are less visible to energy customers
- Complicated transaction structure that involves the utility

SPOTLIGHT **ABUJA ELECTRICITY DISTRIBUTION COMPANY (AEDC) AND DAYSTAR PILOTED THE INNOVATIVE UTILITY-ENABLED COMMERCIAL AND INDUSTRIAL BUSINESS MODEL**

Exhibit 9. Representatives of AEDC, Daystar, and The Wood Factory at the contract-signing ceremony

The Wood Factory is a furniture manufacturer in Idu Industrial District in Abuja. It is currently not connected to the grid and relies 100% on diesel generators. Rising diesel costs are hampering the company, and it needs an alternative energy solution. In January 2024, AEDC, Daystar, and The Wood Factory signed a tripartite agreement to implement an innovative project using a utility-enabled commercial and industrial business model, the first in Nigeria.

In the project, AEDC brings a customer back to the grid and will supply power between 3 p.m. and 9 a.m. The on-site system, with 594 kW solar and 600 kWh battery, will provide power from 9 a.m. to 3 p.m. and serve as grid backup. The solution is expected to yield a 44% reduction in energy costs and reduce carbon emissions by 76% annually.[24]

5 COMMERCIAL STREET AND CLUSTER

In this model, an urban or peri-urban area where the customers are predominantly SMEs is run on an interconnected mini grid. Customers within the area will be ring-fenced from other customers in the area, and customers' connections will be reorganized, with new meters installed to ensure a clean and manageable network. Projects under this business model use DERs to improve service to customers while strengthening the grid.

ADVANTAGES	DISADVANTAGES
• No up-front costs for energy customers • Blend in cheaper on-grid supply • More efficient accounting	• Project costs and system operations less visible to energy customers • Complicated transaction structure that involves a group of customers and the utility

SPOTLIGHT GREEN VILLAGE ELECTRICITY (GVE) DEVELOPED FIRST INTERCONNECTED MINI GRID WITH AEDC FOR THE WUSE MARKET

Exhibit 10. Shops in Wuse Market adopted on-site solar

Exhibit 11. Interconnected mini grid at Wuse Market

Wuse Market is one of the main commercial hubs in Abuja, housing 5,000 shops that trade mostly fast-moving consumer goods as well as textile and crafts.[25] The market has battled with intermittent supply from the grid for years, and over 3,000 shop owners use diesel genset as backup. At the same time, AEDC, the utility, continues to struggle with high aggregated technical commercial and collection (ATC&C) losses.

GVE signed an agreement with AEDC and Wuse Market Traders Association for the development of a 1 MW interconnected mini grid. Through the business model, GVE blends the supply from the grid with solar and battery on-site to provide guaranteed uptime during the market's operating hours. Effectively, ATC&C losses to the grid are reduced to less than 10%. Phase 1 of the project, to be commissioned in June 2024, will connect about 950 customers. The project will have more than 2,000 customer connections upon completion.

OFF-SITE OPTIONS

In Nigeria, many customers have limited on-site space. Although rare, off-site solutions are possible. Developers and energy customers must heavily invest in the complex project design and development process involving the utility and regulator. There are few projects adopting off-site models to date, but such solutions are gaining more interest with huge potential to drive corporate clean energy access.

6 OFF-SITE PPA

Through off-site PPAs, energy customers are no longer limited by physical space within their facility and can decide how much clean energy they want to procure, up to 100% of their consumption. To implement off-site PPAs, developers need to work extensively with TCN and DisCos to deliver electricity to large commercial and industrial off-takers. To this point, Konexa is the only developer in Nigeria that has completed such a PPA. Konexa obtained an energy trader license and extensively engaged and collaborated with TCN and the DisCo. In May 2022, Nigerian Breweries Plc, a member of the Heineken Group, signed an off-site PPA with Konexa to deliver renewable energy to its two plants in Kaduna, covering 100% of its electricity needs.[26] The project is under construction.

ADVANTAGES	DISADVANTAGES
• No up-front costs for energy customers • Large-scale transaction that could lead to lower cost electricity • Significant clean energy impact; customers can source 100% renewable energy for their consumption	• Complicated transaction structure that involves extensive collaboration with utilities (DisCo and TCN) • Lengthy project development • High project development cost

7 RENEWABLE EMBEDDED GENERATION (REG)

REG is an effective way to use DERs to improve reliability for a large group of customers within a DisCo territory. In the REG model, a developer builds solar embedded generation to inject to the feeder along with enough battery storage and fossil fuel backup (if necessary) to guarantee reliability to selected customers. The REG interconnects at a distribution substation, and selected premium customers can receive 24/7 reliability while other customers within the substation area will have improved services (not 24/7 reliability).[27] A mix of REG electricity and electricity from the main grid is sold to REG customers at premium tariffs for premium customers (such as big commercial and industrial customers within the service area) and service-based tariffs for nonpremium customers. An independent collection account is set up, into which customer payments from REG-served feeders will go, separating them from DisCos' existing collection accounts to provide revenue assurance for the developers.

Eko Electricity Distribution Company is actively exploring a REG pilot at FESTAC Town. FESTAC Town is an urban area on the Lagos mainland with significant unmet demand due to insufficient supply capacity at the feeder level. The REG solution, preliminarily sized at 8.5 MW of solar generation, will improve DisCo operations and income and can reduce customer energy costs by 40%–50%. Millwater is the developer, and the project is in the design phase.

ADVANTAGES	DISADVANTAGES
• No up-front costs for energy customers • Large-scale transaction that could lead to lower cost electricity • Significant clean energy impact	• Complicated transaction structure that involves the utility • Low visibility of the transaction process and project costs to energy customers • Lengthy project development

8 POTENTIAL UTILITY PROGRAMS (NOT YET AVAILABLE)

Utility programs such as green tariffs and utility subscriptions allow multiple customers to subscribe to a portion of a large clean energy project. The utility will be the off-taker of the PPA, and customers will pay through a different utility tariff. These programs offer corporate energy customers a straightforward way to access clean energy that requires fewer internal resources to manage. Energy customers won't be constrained by on-site space and will have greater flexibility to meet their energy needs.

Utilities are interested, but setting up such programs is not a priority for them today as they focus on improving grid infrastructure and reliability. But the model still presents significant opportunities. There are already renewable developers looking at developing grid-connected, utility-scale solar and hydro generation. In addition, the upcoming DisCo-level renewable targets will mandate utilities to integrate more renewables. Utilities will most likely need to upgrade the grid infrastructure to accommodate the increased capacity, and programs like green tariffs could be a good way for utilities to increase revenues and finance network upgrades. We expect the market to grow with upcoming policies and improvements in the transmission and distribution networks.

ADVANTAGES	DISADVANTAGES
• No up-front costs for energy customers • Simple transaction and quick to deploy • Large-scale transaction that could lead to lower cost electricity • Significant clean energy impact; customers can source 100% renewable energy for their consumption	The option is not available in Nigeria yet. To set up such programs, utilities must upgrade grid infrastructure and carry out studies to inform program design, then tender developers.

In summary, different business models are being implemented in Nigeria, and each has advantages and disadvantages. Corporate energy customers can assess the suitability of these options based on their needs, preferences, and resources. On-site solutions are most prevalent today. Direct investment and PaaS/SaaS models in particular are more mature and relatively quick to deploy, but customer empowerment and clean energy impact will largely depend on the space availability on-site. Business models involving the utilities are more complex and take longer to develop, but they bring higher clean energy impact and scalability. Exhibit 12 lays out our evaluation of procurement options against the six key considerations.

Exhibit 12. Evaluation of procurement options and business models

Business Model	Implementation Status	Evaluation Ratings					
		Customer Empowerment	Clean Energy Impact	Project Complexity	Implementation Timeline	Price Risk	Scalability
1 **Direct Investment**	Implemented	2	2	1	5	1	2
2 **PaaS, SaaS**	Implemented	2	2	2	5	2	3
3 **Lease to Own**	Implemented	2	1	2	4	3	1
4 **Utility-enabled Commercial and Industrial**	In progress	3	3	4	2	3	5
5 **Commercial Street**	Implemented	1	3	3	2	3	3
6 **Off-site PPA**	In progress	5	5	5	1	3	5
7 **REG**	In progress	1	5	3	2	2	4
8 **Utility Programs**	Not started	5	5	5	1	1	5

SUMMARY OF KEY CHALLENGES

Throughout the study, it became apparent that corporate energy customers and developers face many challenges when pursuing clean energy projects. We group the key challenges under four themes.

1 Awareness and knowledge gaps among customers and developers

Many corporations in Nigeria have limited understanding of clean energy procurement options and the risk and benefit profiles related to each option. This is partly due to their limited exposure to relatable projects and proof points. This leads to customer lack of confidence in clean energy projects and a very lengthy and slow internal process, adding to the already long project development timeline.[xii] Developers often have to do rounds of customer engagement, sometimes repetitive, to persuade companies to go forward. In most cases, developers do not have direct access to the decision-makers, as the value proposition of the projects is often presented to the company's leadership through their internal team (for example, the utility or facility manager). Even when corporations see the value of clean energy, many lack the internal capacities and resources to evaluate project opportunities properly and follow through on project development.

On the other hand, only a few well-financed developers can invest heavily in customer acquisition, tailor solutions to meet customer needs, navigate the legal and regulatory process, and successfully implement projects. For example, many DER developers in Nigeria are international developers who focus on deploying smaller solutions quickly, so they are not investing in exploring other delivery models or becoming experts in local policies and regulatory processes.

2 Lack of regulatory clarity and incentives

The ETP and other power sector strategy documents focus primarily on improving grid infrastructure, expanding generation capacity, and replacing diesel and petrol captive gensets. The call for clean energy development is vague; there are targets for solar-installed capacity and renewables share in the energy mix, but they are not unified or binding. There also aren't clear mandates or guidance for transmission and distribution companies to incorporate more clean energy into the energy mix. Despite being called out in several policy documents, tax or fiscal incentives don't exist yet in Nigeria to stimulate the clean energy market. Clean energy products cannot take advantage of duty exemptions and can get stuck in customs for a long time. In addition, corporations and DER developers don't seem to have an organized channel to reach policymakers to advocate for change.

The regulatory process for developing energy projects can be cumbersome and obscure, so developers often avoid dealing with the regulator, NERC, to save time and money. For example, systems above 1 MW require a generation license from NERC with a USD-denominated license fee. As a result, we see developers cap their projects at 999 kW or deploy multiple systems at one site and then connect them later, which is not always optimal for customers.

xii Based on RMI research and project experiences, project development timeline can range from three months (e.g., for a SaaS project with solar panel in stock) to two years (e.g., for a utility-enabled commercial and industrial project considering supply chain lead time).

3 Perceived cost premium of clean energy and financing risks

Most corporate energy customers are sensitive to costs. For off-grid customers, clean energy can provide clear savings as diesel and petrol prices keep increasing. For on-grid customers, clean energy comes with a premium, at least on paper, especially when compared with non-cost-reflective on-grid tariffs. However, customers often fail to take into consideration the value of improved reliability and electricity service, which helps them reduce business disruptions, potential equipment damage, and the use of expensive diesel backups. Regardless, the common impression is that clean energy is expensive, and there aren't other mechanisms (such as tax credits and carbon markets) to monetize renewables in Nigeria today.

The unstable foreign exchange against local currency is a top concern among developers and investors. Investment and financing for such projects is in hard currencies (like US dollars and euros) for procurement of hardware components, and the revenue and cost savings are in local currency (naira). This is even more concerning since the new president's monetary policy reform in June 2023 to unify the exchange rate[xiii] and move toward market-driven exchange rate mechanisms. Since then, the naira exchange rate has been extremely unstable. Even though there is interest, Nigerian commercial banks only offer debt financing from two to four years, which is not sufficient for most renewable energy projects. Only a few corporations and developers with strong balance sheets can access affordable and long-term finance from international investors. The high financing and transaction costs further increase the total project cost, which is then transferred to the energy customers.

4 Fragmented ecosystem and underdeveloped stakeholder network

The market for clean energy projects is fragmented and it can be challenging to navigate. Many energy customers are in the dark without a trusted network of consultants, developers, EPC contractors, suppliers, or other service providers. For energy customers who directly invest in clean energy assets, uncertain access to after-sale service (for hardware and software) adds risk. Furthermore, different stakeholders rarely convene and collaborate among themselves, missing the opportunity to learn from each other and share ongoing efforts and market updates. This is also why utility-enabled projects take a lot of back-and-forth to materialize today, as customers, developers, and utilities have not built trusting relationships. There is a need for them to collaborate more to explore and test various business models to ensure successful implementation of clean energy solutions to establish proof of concept and build trust.

xiii Previously, Nigeria implemented a multiple exchange rate regime, commonly referred to as the "black market rate" and "central bank official rate" during the administration of former President Muhammadu Buhari.

RECOMMENDATIONS

Based on feedback from stakeholder engagement and the high-level needs assessment, we recommend a set of interventions along with near-term actions to unlock the full market potential for corporate clean energy procurement in Nigeria.

Awareness and capacity building to fill the knowledge gaps

To cultivate more demand-side "pull" for clean energy projects, it is important to build awareness among corporations by educating them about clean energy technologies and business models, and showcasing successful projects. This can be done through convenings, regular briefings, and training events. A "**one-stop shop**" can be particularly helpful to equip interested energy customers with the knowledge and tools to pursue the right projects. The one-stop shop can house a database of experienced and vetted developers, standardized documents (such as tendering documents and contract templates), viable financing options, policy updates, etc. Developers can also benefit from these resources and keep themselves up to date with policies and market trends.

For more immediate considerations, we encourage **forming a cohort of interested energy customers** and partnering with Nigerian entities that already have strong relationships with corporations (like MPDC) to build awareness among them broadly. Then, informed by customer and broader sector needs (from a more interactive needs assessment exercise), we encourage prioritizing and developing toolkits and educational resources for dissemination to corporate energy customers and other stakeholders. CEBA, with abundant experience organizing boot camps and bringing members together, is well positioned to lead the effort.

Setting policies and incentives to send clear market signals

The Ministry of Power, the Ministry of Finance, ETO, and NERC need to act fast and collaborate to establish **clear clean energy targets, mandates, and incentives** to send strong signals to guide the market and drive demand. More specifically, the Ministry of Power and NERC should accelerate the implementation of the Electricity Act, 2023, including cost-reflective grid tariffs, feed-in tariffs, source-specific subsidies, and work with state governments to develop net-metering programs. These actions will create a regulatory environment that attracts investment and deployment of clean energy projects. The Ministry of Finance, in collaboration with power sector stakeholders, should introduce tax and fiscal incentives (such as tax breaks, tax credits, subsidies, duty exemption for imports of DER components) to promote the adoption of clean energy. ETO should continue carrying out studies, providing guidance, and advocating for a clean energy transition. Policymakers will most likely require support for successful implementation, and several development partners (for example, GIZ and World Bank) are already providing technical assistance in the regulatory space, so coordination is imperative to avoid the duplication of efforts.

Another key intervention is to **further clarify and streamline the regulatory process**. We suggest that development partners that currently provide technical assistance to power sector policymakers should work closely with NERC to clarify and improve the regulatory approval process for various clean energy projects, including revisiting the licensing requirements and licensing fee structure. Development partners can then support the creation of clear step-by-step guides for regulatory processes for customers and developers. In addition, corporations can build and strengthen relationships with the ECN, the ETO, the Ministry of Power, and NERC through joint working sessions, retreats, or the like. This way energy customers and market system stakeholders can amplify their collective voices and have a channel to reach stakeholders responsible for policymaking and implementation. The Clean Energy Demand Initiative led by the US Department of State, for instance, offers a great platform to facilitate such dialogues.[28]

De-risking projects to unlock financing

De-risking can lead to lower project costs and easier access to finance. To increase investor confidence, energy customers and developers could benefit from **tailored technical assistance to de-risk clean energy projects** and varying degrees of support throughout the project development cycle and implementation. Given the global supply chain challenges in recent years, supply chain support such as bulk procurement can reduce costs and procurement lead time. The Demand Aggregation for Renewable Technology (DART) program set a precedent for such support, but DART currently applies to only rural electrification projects. Expanding DART to commercial and industrial projects could drive a broader impact. Also, as discussed in the report, utility programs present substantial and potentially more affordable opportunities for corporate clean energy procurement. When policies and infrastructure upgrades are in place, we suggest working closely with utilities to design suitable products and programs.

Policies, grant support, and concessional loans can **enable affordable finance** (for example, the SUNREF program), and it would be important for policymakers and development partners to deliberately design suitable financing facilities, schemes, and products for commercial and industrial projects. To manage financing risks, another critical puzzle is how to **hedge against unstable foreign exchange**, which requires sector stakeholders to join together to come up with innovative solutions.

Fortifying the sector networks to facilitate transactions

Closing transactions often requires fostering collaborations and partnerships. Many of the interventions recommended above (such as an energy customer cohort, the one-stop shop, policy advocacy) will naturally strengthen the networks for corporate clean energy procurement. Nonetheless, it is highly recommended to create myriad opportunities for energy customers, developers, financiers, policymakers, and utilities to **connect, share input, and learn from one another**. We recommend facilitating ongoing working groups and/or hosting regular interactive convenings. More important, we advise that energy customers, developers, and utilities gain hands-on experience through demonstration projects to establish proof of concept. This can boost trust and collaboration among partners, and allow them to learn and adapt their approach to project design, project development, and implementation.

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