ICAT Initiative for Climate Action Transparency

NATIONAL COUNCIL ON CLIMATE CHANGE
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# Initiative for Climate Action Transparency ICAT

## Assessing the GHG Impact of the Renewable Feed-in tariffs (FIT) Regulations on RE Addition and GHG Reductions in Nigeria

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PREPARED UNDER

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# Deliverable J: Report on the FIT  P&M Assessments


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## Abbreviations and Acronyms

| | |
|---|---|
| **BAU** | Business as Usual |
| **CAPEX** | Capital Expenditure |
| **CCA** | Climate Change Act |
| **CIFF** | Children's Investment Fund Foundation |
| **DCC** | Department of Climate Change |
| **DRE** | Decentralised Renewable Energy |
| **DTU** | Technical University of Denmark |
| **ECN** | Energy Commission of Nigeria |
| **EPSRA** | Electric Power Sector Reform Act |
| **ERP** | Emission Reduction Potential |
| **ETP** | Energy Transition Plan |
| **ETF** | Enhanced Transparency Framework |
| **FIT** | Feed-in Tariff |
| **FMoEnv** | Federal Ministry of Environment |
| **FMoP** | Federal Ministry of Power |
| **GHG** | Greenhouse Gas |
| **GST** | Global Stocktake |
| **GW** | Gigawatt |
| **ICAT** | Initiative for Climate Action Transparency |
| **IEA** | International Energy Agency |
| **IHA** | International Hydropower Association |
| **IMET** | Italian Ministry of Ecological Transition |
| **IPCC** | Intergovernmental Panel on Climate Change |
| **IPPs** | Independent Power Producers |
| **IRENA** | International Renewable Energy Agency |
| **LCOE** | Levelized Cost of Electricity |
| **LEAP** | Long-range Energy Alternatives Planning |
| **MRV** | Monitoring, Reporting and Verification |
| **MW** | Megawatt |

| | |
|---|---|
| **MYTO** | Multi-Year Tariff Order |
| **NBS** | National Bureau of Statistics |
| **NC** | National Communication |
| **NCCC** | National Council on Climate Change |
| **NDC** | Nationally Determined Contribution |
| **NERC** | Nigerian Electricity Regulatory Commission |
| **NIEP** | Nigeria Integrated Energy Plan |
| **NPC** | Net Present Cost |
| **NREEEP** | National Renewable Energy and Energy Efficiency Policy |
| **PA** | Paris Agreement |
| **PAM** | Policy and Measures |
| **PPA** | Power Purchase Agreements |
| **PV** | Photovoltaic |
| **RE** | Renewable Energy |
| **REA** | Rural Electrification Agency |
| **REMP** | Renewable Energy Master Plan |
| **RESIP** | Rural Electrification Strategy and Implementation Plan |
| **RET** | Renewable Energy Technology/Technologies |
| **SIP** | Scenario Implementation Plan |
| **TCN** | Transmission Company of Nigeria |
| **UNEP** | United Nations Environment Programme |
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **UNOPS** | United Nations Office for Project Services |

## ABSTRACT

Climate change, arising from anthropogenic activities, has been identified as one of the greatest challenges facing the world. It will continue to affect business and citizens over future decades. Climate change has implications for both human and natural systems. It could lead to significant impacts on resource availability, economic activity and human wellbeing. In response, international, regional, national and local initiatives are being developed and implemented by public and private sectors to mitigate greenhouse gas (GHG) concentrations in the Earth's atmosphere, as well as to facilitate adaptation to climate change.

There is a need for an effective and progressive response to this urgent threat of climate change, on the basis of the best available scientific knowledge. Under the Paris Agreement, all Parties to the United Nations Framework Convention on Climate Change (UNFCCC) agreed on the ambitious goal to limit the increase in global average temperature to well below 2°C, and pursue efforts to limit warming to 1.5°C.

The main framework to achieve the objective of the Paris Agreement is the countries' Nationally Determined Contributions (NDCs). In this context, the Government of Nigeria approved the country's NDC, establishing domestic mitigation actions and adaptation measures, including the improvement of access to renewable energy (RE) through the implementation of policies and programs as specific mitigation contributions. Nigeria's Renewable Energy Feed-in Tariff (REFIT) regulation, although not yet operational, is a policy instrument expected to provide a substantial contribution to emission reductions set out in this mitigation regulation.

The objective of this assessment is to apply the Initiative for Climate Action Transparency (ICAT) renewable energy guidance. Specifically, this guidance is utilised to estimate the impact of RE addition and the GHG emission reductions of the REFIT regulation. This estimation will be applied ex-ante, compared to what would have occurred in a baseline scenario. This will enable Government, to determine the REFIT's potential contribution to meet the NDC's goals and RE targets.

The GHG impact of the REFIT was estimated using the excel-based estimation and the Long-range Energy Alternatives Planning System (LEAP) energy model. The results reveal that, in the baseline scenario starting in 2020, the cumulative emissions are 40.48 and 69.8 $MtCO_2eq$ in 2020 and 2030, respectively. Emission reductions in the NDC_REFIT scenario is zero, considering that expected increase is not associated with renewable energy electricity plant. Rather, retrofits of 50% of the existing open cycle gas power plants, which is expected to reduce the GHG emissions by about 9$MtCO_2$ within the period 2025-2030 this is equivalent to a 33% reduction compared to the Business as Usual (BAU) scenario. However, achieving

REFITs full implementation would only be noticeable after 2030, when most of the grid-connected solar power projects are expected to be implemented. In 2060, grid-connected renewable power plants are expected to have the capacity of 263GW, which under BAU would have been mostly fossil fuel driven power plants. While it is assumed that hydro power plants would have been constructed regardless which represents the extra 11GW which makes the 274GW grid-connected power plants. The impact of the ETP_REFIT scenario is about 247 $MtCO_2$, which will be avoided due to expected complete switch to renewables and hydrogen fuel power plants. This represents approximately an 82% reduction, corresponding to replacement of 82% of the power plants with renewable-based power plants in 2060.

This assessment identified the main barriers that can hinder accurate estimations of GHG and, consequently, the implementation of monitoring, reporting, and verification (MRV) for the REFIT regulation. MRV of the REFIT implementation will be needed in order to properly assess the effectiveness of the regulation and enable the required UNFCCC reporting through National Communications (NC), Biennial Update Reports (BUR), and the coming Biennial Transparency Reports (BTR).

The identified barriers range from lack of will from institutions to implement REFIT, weak coordination between institutions, lack of consistent data, lack of robust mechanisms for data collection, and lack of budgetary allocations for MRV activities. However, these barriers can be overcome by establishing a clear definition of roles and responsibilities between, and within, the institutions. This will enhance institutional capacities for MRV and local experts, and improve mechanisms for data collection, processing, and sharing.

## 1. INTRODUCTION

The adoption of the Paris Agreement at the twenty-first Conference of the Parties (COP21) marked a global commitment to limit the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit warming to 1.5°C. Achieving this long-term temperature goal requires deep and sustained reductions in global GHG emissions across all major emitting sectors, particularly the energy sector. The primary mechanism, through which Parties communicate their national mitigation and adaptation efforts under the Paris Agreement, is through NDCs (Nationally Determined Contribution). NDCs use NDCs to outline country-specific climate action priorities, targets, and implementation pathways. Nigeria, as a Party to the Paris Agreement under UNFCCC. It has articulated its climate commitments through its updated NDC. Its updated NDC identifies the energy sector as a critical pillar for achieving its mitigation objectives, while simultaneously advancing national development priorities.

In recognition of the need to track progress toward the goals of the Paris Agreement, in a transparent, comparable, and credible manner, Article 13 of the Paris Agreement established the **Enhanced Transparency Framework (ETF)**. The ETF seeks to strengthen mutual trust and confidence among Parties (specifically, national governments) and to promote the effective implementation of climate actions. These actions comprise, primarily, improved systems for monitoring, reporting, and verification (MRV) of mitigation actions, support received, and progress toward, NDC targets. For developing countries, such as Nigeria, operationalizing the ETF requires strengthened institutional arrangements, robust data collection and analyses systems, and enhanced technical capacity for tracking the impacts of sectoral policies and measures (PAM) on emissions trajectories.

Within this context, the Initiative for Climate Action Transparency (ICAT) provides methodological guidance and capacity support to developing countries to assess the impacts of climate policies and actions, and to strengthen transparency systems aligned with ETF requirements. The ICAT Renewable Energy Guidance (REG) sets out a structured approach for estimating the greenhouse gas (GHG) mitigation impacts of renewable energy (RE) policies by comparing projected emissions under a baseline scenario with emissions under a policy implementation scenario.

Applying this guidance to Nigeria’s renewable energy policy enables a systematic assessment of how renewable energy support mechanisms can contribute to national emissions reduction targets. This also delivers co-benefits in terms of energy access, energy security, and socio-economic development.

Nigeria's energy sector is characterized by rapid growth in electricity demand driven by population increase, urbanization, and economic development.

Despite significant natural resource endowments, including abundant solar, wind, hydro, and biomass energy potential, the country continues to experience persistent electricity supply deficits, high reliance on self-generation (i.e. "auto-generation) using diesel and petrol generators ("gensets"), and significant system losses across the power value chain. These structural challenges have resulted in elevated emissions from electricity supply, as well as high energy costs for households and businesses, and constrained industrial productivity. Consequently, the expansion of renewable energy generation capacity presents a strategic opportunity to decarbonize Nigeria's power sector. It would also improve energy access, reduce fuel price volatility, and enhance the resilience of the national energy system.

Nigeria's NDC identifies renewable energy deployment, energy efficiency improvements, and power sector reforms as key mitigation measures. It should be noted that much i of the mitigation target will be conditional upon international financial, technical, and capacity-building support.

However, while several policy instruments and regulatory frameworks have been introduced to promote renewable energy investment, the actual pace of deployment has been slow. It has remained below the level required to place the power sector on a low-emissions development trajectory consistent with Nigeria's climate commitments. Furthermore, systematic ex-ante assessments of the potential GHG impacts of renewable energy policy instruments remain limited. This has, and continues to have, constraints to enable evidence-based policymaking and the prioritization of high-impact interventions. The absence of both indicators remains a major constraint on improved energy policy making.

Against this backdrop, the objective of this assessment is to apply the ICAT Renewable Energy Guidance (REG). To estimate, on an ex-ante basis, the renewable energy addition and associated GHG emission reductions, requires evidence and data to show achievement of effective implementation of Nigeria's renewable energy support mechanisms, relative to a counterfactual baseline scenario.

The assessment set out here aims to quantify:

- quantify the potential contribution of renewable energy policies to Nigeria's NDC mitigation targets;
- identify key design features and implementation barriers that influence policy effectiveness;

- provide actionable recommendations to strengthen data collection, institutional coordination; and,
- MRV systems in line with ETF reporting requirements.

The findings of this report are intended to support evidence-based policy design, enhance transparency in climate action reporting, and inform strategic decision-making to scale up renewable energy deployment as part of Nigeria’s low-emissions development pathway.

Nigeria ranks as the country with the largest power generation potential in West Africa. Hydropower constitutes slightly above 20% of the country’s electricity generation, and natural gas accounts for about 80% of the total electricity generated. Nigeria has a large hydro-electricity potential estimated at approximately 24 GW; and a small-hydro potential of about 3.5 GW.

This potential is yet to be exploited, due primarily to cheap natural gas and ease in terms of time and cost of implementing open-cycle gas turbine power generation. However, Nigeria's energy sector is undergoing a significant evolution, driven by the need for increased electricity access and a transition towards cleaner energy sources, particularly renewable energy.

In 2025, Nigeria had approximately 2.5 GW installed capacity of large hydroelectricity and approximately 60 megawatts of small hydroelectricity.[1] Electricity has been identified as one of impediments to economic growth in Nigeria. Despite the enormous potential in Nigeria’s electricity “sustainable” generation capacity, the power sector faces key challenges which has been repeatedly identified and highlighted in several publications in the country:

- the lack of reliable and efficient evacuation infrastructure for electricity produced.
- the imbalance between the generation, distribution and transmission capacities due to ageing and weak infrastructure; and,
- Inadequate metering and losses in revenue collection. Electricity demand growth in the country is increasing, especially in residential and commercial buildings.

[1] ECN, 2014b; IHA, 2021; U.S. Department of Trade, 2021.

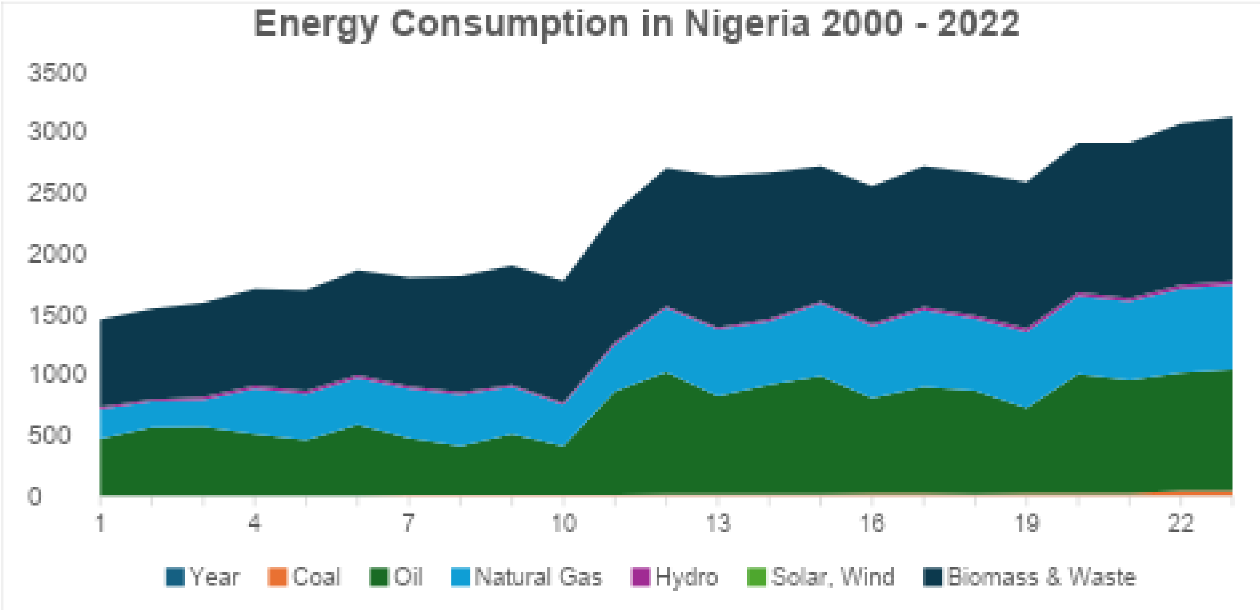


**Figure 1: Energy sector growth in Nigeria in terms of total energy supply by source.**

Figure 1 shows statistics from the International Energy Agency (IEA) on how Nigeria's energy sector evolved from 2000 to 2022.

As shown above, Nigeria's energy matrix is composed primarily of natural gas, petroleum, biomass, waste, hydroelectricity, and coal. Coal has been reintroduced as well as solar electricity. Solar and wind energy are gradually being utilised in the country. The growth and proportion of solar and wind is relatively insignificant relative to petroleum and natural gas. It is worth noting that a significant portion of natural gas consumption is in the power sector.

However, biomass and waste are consumed traditionally and generally not through modern technologies. While waste has recently been introduced and utilized in the production of cement. there is little waste used as an energy source in industry in Nigeria[2]. While natural gas currently dominates power generation (80%), with petroleum-fired generators making up most of the rest, Nigeria is actively exploring its solar potential and integrating solar PV into the grid.

[2] Recently, several palm oil refineries have installed "palm oil residues/waste" gasification to generate both heat and electricity for their own on-site utilisation, as well as for limited export to local electricity grids.

Nigeria has a Renewable Energy Master Plan (REMP)[3] targeting a substantial increase in renewable energy contribution to electricity generation. The plan aims to raise the share of renewables from 13% in 2015 to 23% by 2025 and 36% by 2030.

The Government has recently (January 2025) published the BTR1[4] and submitted to the UNFCCC. The third NDC has also been submitted in September of 2025. It identifies the energy sector as one of the priority sectors for the mitigation of GHG emissions, due to its high share of national emissions and potential for emission reduction through the implementation of alternative energy policies. While Nigeria's energy sector is one of the priority sectors, the assessment of GHG impacts on the implementation of energy policies is critical and necessary to support decision-making towards energy transition, while assessing their contribution to emissions reductions. Nigeria has indicated a strong and ambitious renewable energy transition to 2060[5]. This shows that the GHG impact assessment of renewable energy policies is important. It is necessary to identify opportunities and gaps in effective GHG mitigation strategies. Implementation of the recommendation in an impact assessment of renewable energy potential will provide e credence and evidence to support decision-making by the energy transition office[6], policymakers and stakeholders to understand the relationship between policies and expected GHG impacts.

Nigeria's electricity industry is gradually transforming, with the number of off-grid and mini-grid installations increasing. However, with the challenges in the gas supply distribution to the gas power plants, demand declined by about 6% in 2024 (IEA, 2025). There is, therefore, a growing role of renewables in the energy mix, this is also reflected in how policy changes and infrastructure investments are influencing electricity generation, distribution, and access. The responsibility to drive the implementation of renewable energy technologies rest more with the Rural Electrification Agency (REA) of Nigeria. The institution is responsible for coordinating and driving investment into implementation of mini-grids and off-grids especially in rural and unserved/underserved areas. The overall goal is to influence electricity generation, distribution and access to enhance Nigeria's electricity generation and utilisation.

As Nigeria works to expand electrification and integrate more renewable energy sources, in line with its NDC and energy transition strategies, it continues to make strides, albeit with very slow implementation of energy

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[3] https://www.nigeria-energy.com/content/dam/markets/emea/nigeria-energy/en/2023/docs/NE23-NigeriaEnergyRoadmap-Report.pdf. February 2023

[4] https://unfccc.int/documents/645210

[5] NES 2022 Energy Transition for Achieving Net-Zero Emission by 2060_Comments from ECN.pdf

[6] The Nigeria Energy Transition office is situated in the office of the Vice President of Nigeria. The office coordinates all energy transition activities in Nigeria ensuring its adherence in the pathway to energy transition as communicated by Nigeria.

access to rural and isolated communities through the RE implementation, which contributes to mitigation actions in its NDC.

**Brief Overview of Renewable Energy Feed-in Tariff Regulation**

The Nigeria Electricity Regulatory Commission (NERC) which was set up based on the Electricity Power Sector Reforms of 2001 to drive the regulatory activities within the Electricity industry. It was set up as institution under the President's office to give an impetus to the drive for reforms in the power sector.

The institution has considered the use of different renewable energy sources to:

- Encourage embedded generation, thereby reducing the load on the transmission network and reducing distribution losses associated with the network.
- Encourage uptake of and stimulate innovation in renewable energy technology (RET, either generally, or a specific type of technology); and,
- Reduce greenhouse gas emissions by lessening reliance on fossil fuels. Electricity generation costs vary according to the renewable energy source and technology used. Therefore, the FIT levels will be technology-specific and will depend on:
    - The investment costs for the plant.
    - The O&M Costs.
    - Fuel costs (where applicable).
    - Financing costs and return on the invested capital.
    - Estimated lifetime of the power plant, and capacity of the plant.

**State of Electricity in Nigeria driving increase in Renewable Energy Adoption**

Nigeria's installed electricity capacity has increased to 14 gigawatts (GW) in 2024 with the addition of the Zungeru hydroelectric plant. However, despite these additions, in the first half of 2024, the average daily available capacity was 4.14 GW, slightly lower than the 4.54 GW recorded in 2023[7]. The causes of the discrepancy have been attributed to gas shortages[8], ageing infrastructure, and electricity vandalism. One factor behind the discrepancy is the performance of gas-fired power plants, which account for 77% of

[7] https://nerc.gov.ng/wp-content/uploads/2024/09/2023_Annual_Report.pdf
[8] https://businessday.ng/news/article/expect-blackout-as-tcn-raises-alarm-on-gas-shortage/

generation. Many have faced operational challenges, with some experiencing availability factors as low as 5% due to limited gas supply.

According to an IEA report[9] in 2023, hydropower remains the dominant renewable energy source in Nigeria, but solar PV is gradually gaining traction especially in the rural and peri-urban areas, particularly in rural areas where it serves as a key distributed energy solution. Accelerating rural electrification, Nigeria's Rural Electrification Agency (REA) has signed Memoranda of Understanding (MoUs) for 1.26 GW of decentralised renewable energy (DRE) projects. These projects, which include mini-grids and standalone solar systems, aim to expand electricity access in underserved communities and reduce dependence on fossil fuels.

Interestingly, the Nigeria government through the Nigeria's Electricity Act 2023 has allowed options of decentralisation of power generation and distribution, enabling states to create local electricity markets[10]. Lagos and Enugu States in Southwestern and Eastern Nigeria is leading with plans for an electricity market independent of the national grid. The Lagos State Electricity Bill 2024 aims to set up a comprehensive framework for a sustainable and competitive electricity landscape in the state, with a particular emphasis on enhancing infrastructure, promoting renewable energy adoption and ensuring consumer protection[11].

Electricity tariffs for high-paying customers (Band A, highest tariff category, who are guaranteed 20 hours of electricity daily) were raised, and gas prices for power generation increased by 11% to reduce subsidies and move toward cost-reflective tariffs.

Also, the Nigerian Electricity Regulatory Commission (NERC) issued an order to establish an Independent System Operator for Nigeria. This new entity will take over all market and system operation contracts and obligations previously managed by the Transmission Company of Nigeria (TCN). It is expected that this reform would mark a significant step forward in Nigeria's decentralization of the electricity sector.

Meanwhile, solar PV adoption is rising, especially in rural areas, as a decentralized solution to energy access. At the Mission 300 Africa Energy Summit in January 2025, Nigeria pledged to increase the share of renewable energy in its generation mix from 22% to 50% by 2030, a significant shift aimed at improving energy security and sustainability.

The government plans to systematize least-cost grid generation expansion planning, ensuring new power projects are both financially viable and strategically aligned with national energy goals. Additionally, Nigeria

[9] https://www.iea.org/countries/nigeria/energy-mix
[10] Impact Of The Electricity Act 2023 On Electricity Market And Stakeholders In Nigeria
[11] Lagos plans new electricity law

aims to implement transparent and competitive bidding processes for new generation capacity, particularly in the renewable energy sector, to attract private investment and drive efficiency.

As of 2025, key policy actions were expected to lay the foundation for this transformation. The National Integrated Electricity Policy and Strategic Implementation Plan (NIEP-SIP) will clarify the roles of government agencies and private sector players in generation expansion. There is also a strong push from the federal government through the office of the Vice President coordinating the energy transition to mobilize private sector funding, with $15.5 billion expected from independent power producers and renewable energy developers.

However, achieving a 50% renewable energy share within the next five years will be significant. The current electricity grid requires substantial upgrades to integrate variable renewable energy sources, such as solar, at scale. Additionally, delays in implementing cost reflective tariffs and uncertainty in regulatory frameworks could deter investor confidence.

The success of Nigeria's generation expansion goals will depend on how effectively the government streamlines project approvals, secures financing and strengthens grid infrastructure to accommodate new renewable energy capacity.[12]

[12] Nigeria's Power Generation Landscape: Insights from 2024 & Projections for 2025, Nigeria's Power Generation Landscape: Insights from 2024 & Projections for 2025

## 2. METHODOLOGY FOR ESTIMATING GHG IMPACTS

This assessment applies the Renewable Energy policy impact assessment methodology developed under ICAT to estimate, on an ex-ante basis, the GHG emission reductions attributable to renewable energy policy instruments in Nigeria. The methodology follows a counterfactual scenario approach, whereby projected emissions under a baseline (no-policy) scenario are compared with projected emissions under a policy implementation scenario in which renewable energy deployment is accelerated through targeted support mechanisms. The difference between these two trajectories represents the estimated mitigation impact attributable to the policy intervention.

The analytical framework adopted in this assessment is consistent with good practice guidance on ex-ante policy impact evaluation and is aligned with the reporting requirements of the ETF under Article 13 of the Paris Agreement. The assessment focuses on electricity generation-related emissions in Nigeria's energy sector, given the central role of power sector decarbonization in achieving national mitigation targets and the significant mitigation potential associated with scaling up renewable energy generation capacity.

The choice of the LEAP model was considered most logical for consistency with the recently developed NDC plan; the baseline scenario for this assessment is the same as that of the NDC approved by the government of Nigeria. The baseline uses the available historical data provided by Energy institutions such as the Nigeria Electricity Regulatory Commission, Energy Commission of Nigeria, Rural Electrification Authority and combined with other sources, as described in the section below about developing the baseline scenario.

### 2.1 Analytical Framework and Scenario Approach

The analysis is structured around the development of two core scenarios:

I. Baseline Scenario reflecting projected electricity generation and associated GHG emissions in the absence of additional renewable energy support policies beyond those already in force; and,
II. Renewable energy policy scenario reflecting the accelerated deployment of renewable energy capacity as a result of targeted policy instruments and incentives. The **baseline scenario** incorporates existing policies, structural trends, and non-policy drivers of electricity demand growth, including population growth, economic expansion, urbanization, and electrification efforts.

The renewable energy policy scenario reflects the incremental impact of renewable energy support mechanisms implemented by Nigeria's power sector institutions, including policy and regulatory actions led by the Nigerian Federal Ministry of Power (**FMoP)**, NERC, and REA. The modelling framework assumes that these institutions effectively operationalize renewable energy incentive mechanisms, including procurement frameworks, tariff-based incentives, and regulatory reforms aimed at reducing investment barriers for renewable energy developers.

### 2.2 Estimation of Renewable Energy Addition

Renewable energy addition under the policy scenario is estimated by assessing the maximum technically and economically feasible deployment of renewable energy technologies (RETs) within Nigeria's electricity system over the assessment period, subject to policy design parameters, grid integration constraints, and institutional capacity. The analysis considers technology-specific deployment pathways for solar photovoltaic (utility-scale and distributed), small and large hydropower, onshore wind, and biomass-based power generation.

Technology costs and performance assumptions are informed by international benchmarks and regional data, including cost trajectories reported by the International Renewable Energy Agency (IREA), and adapted to reflect Nigeria-specific conditions such as local financing costs, inflation, currency risk, import dependency for equipment, and project development risks. Institutional and regulatory constraints, including licensing timelines administered by NERC and grid connection constraints managed by the Transmission Company of Nigeria (TCN), are explicitly incorporated as limiting factors affecting the pace and scale of renewable energy deployment.

### 2.3 Key Assumptions and Limitations

The assessment is based on a set of simplified assumptions regarding electricity demand growth, technology learning rates, financing conditions, and the pace of institutional reforms. While these assumptions are grounded in best available data and expert judgment, uncertainties remain, particularly with respect to macroeconomic conditions, foreign exchange stability, fuel price volatility, and the pace of grid infrastructure expansion. Constraints related to transmission capacity, system losses, and dispatch limitations are incorporated qualitatively, recognizing that Nigeria's grid infrastructure remains a binding constraint on large-scale renewable energy integration.

Additionally, the analysis focuses on direct emissions from electricity generation and does not quantify upstream or lifecycle emissions associated with renewable energy technologies (RETs). The assessment also does not account for potential rebound effects or indirect emissions associated with increased electricity access and consumption. These limitations should be considered when interpreting the results and when using the findings to inform policy design and investment planning.

### 2.4 Data Sources and Institutional Arrangements

Primary data sources for the assessment include national energy statistics published by the Federal Ministry of Power (FMoP) and the National Bureau of Statistics (NBS), electricity market and regulatory data from the NERC, grid operation data from the TCN, and off-grid electrification data from the REA. Supplementary data are drawn from international sources, including the International Renewable Energy Agency (IREA) and technical studies by the Stockholm Environment Institute (SEI), which has supported the development of energy systems' modelling tools applied in similar policy impact assessments.

The assessment assumes that the Energy Transition Plan (ETP) in the power sector is possible and fully implemented. The following are the indicators for the power sector according to the Energy Transition Office (ETO) of Nigeria:

- Total installed capacity increases by 6.8 times between 2020-2060.
- High increase of centralized technologies from 34% in 2020 to 94% in 2060 with an annual growth rate of 8%;
- Diesel decentralized technologies are gradually phased out from 23 GW in 2020 to 3.5 GW (mini grids) in 2060;
- Renewable energy technology (RET) share increases from 5% in 2020 to 82% in 2050, excluding hydrogen;
- Significant uptake of solar PV in 2050, reaching to 209 GW while hydropower reaches to 11 GW in 2060 from 2 GW in 2020 due to need to dispatchable power; and,
- Uptake of biomass (6 GW) and hydrogen (36 GW) in replacement of gas (11.8 GW) by 2060, due to zero emission constraints in 2060 and need of dispatchable power.

It is also assumed that all renewable energy plants have zero emissions in estimating the baseline and impacts based on the ETP implementation plan.

## 3. DESCRIPTION OF NIGERIA's NATIONALLY DETERMINED CONTRIBUTIONS (NDC)

Nigeria's climate mitigation commitments are articulated through its NDC 3.0 submitted in 2025. The NDC outlines Nigeria's medium-term emissions reduction targets, priority mitigation measures across key sectors, and the enabling conditions required to achieve these targets, including international financial, technical, and capacity-building support.

In September of 2025, Nigeria submitted NDC 3.0 which represents a significant advancement in the country's climate ambition under the Paris Agreement. Building upon the initial submission in 2015 and the revised NDC in 2021, this latest update introduces a more data-driven, transparent, and actionable approach to achieve GHG emission reductions. The NDC 3.0 aligns Nigeria's climate priorities with its long-term development agenda, as articulated in the Climate Change Act (CCA, 2021) and the Nigeria Energy Transition Plan (ETP, 2022), while reaffirming the country's commitment to achieving net-zero emissions by 2060.

A major innovation in NDC 3.0 is the transition from relative reductions against a Business as Usual (BAU) trajectory to an economy-wide absolute emission reduction framework, using 2018 as the national baseline year. This approach enhances transparency, comparability, and alignment with the ETF under Article 13 of the Paris Agreement. Furthermore, the NDC 3.0 is addressing 19 Intergovernmental Panel on Climate Change (IPCC) source categories compared to 11 in the NDC 2.0 while increasing the number of measures/actions from 24 in the NDC 2.0 to 39 by 2035 in the NDC 3.0. This enhanced ambition has been worked out to align with the Paris Agreement temperature goal, as per paragraph 37 of the Global Stocktake (GST) and taking into consideration the country's national circumstances

The NDC 3.0 document was developed through an inclusive, participatory process involving the Federal Ministry of Environment (FMEnv) through its Department of Climate Change (DCC), the National Council on Climate Change (NCCC), line ministries, subnational authorities, civil society organizations, and the private sector.

Mitigation targets in Nigeria's NDC 3.0 are based on 2018 as the base year, with reported national emissions of 573.5 Mt$CO_2$e. The NDC also marks a shift from expressing reductions relative to a BAU scenario to expressing them relative to this base-year emissions level, hence net zero is targeted at 2060.targets are absolute emissions reductions of 168.2 Mt $CO_2$e in 2030 and 184.9 Mt $CO_2$ e in 2035 from base year 2018 towards net zero by 2060.

These economy-wide absolute emissions reductions represent 29% and 32% of net national emissions of 2018, in 2030 and 2035, respectively. Nigeria maintains its 20% unconditional objective and views the conditional reduction at 80% of the 29% and 32% reduction of the estimated 2018 emissions in 2030 and 2035, respectively[13].

These targets represent an evolution from earlier NDCs that relied on BAU projections, signifying Nigeria's strengthened data and institutional capacity to adopt an inventory-based, measurable, and verifiable framework. The targets are aligned with the net-zero target by 2060 objective and the national carbon budgeting approach stipulated under the Climate Change Act (2021).

The updated targets also benefit from the methodological consistency of the national GHG inventory submitted alongside the first Biennial Transparency Report (BTR1), ensuring that tracking and reporting processes are harmonized with international best practice under the UNFCCC (UNFCCC, 2023).

### 3.1 Key Mitigation Measures and Actions

The NDC 3.0 identifies 23 priority mitigation measures across key sectors, each supported by quantified emission reduction potentials (ERP) and implementation pathways. These 23 measures were selected from a broader set of 39 actions considered during the NDC 3.0 technical update, only those with robust data and defined mitigation estimates were adopted as official NDC measures. Each measure is defined with expected emission reduction potentials, timelines, and implementing agencies.

According to the NDC 3.0 the energy sector, including both fugitive emissions and solid fuel transformation, is 31.2 MtCO2e; the fuel combustion sector totals 103.4 Mt CO2e. Within this sector, the NDC targets the elimination of routine gas flaring by 2030 and a 60% reduction in fugitive emissions by 2035. In the fuel-combustion component, the NDC also aims to achieve a 52% renewable energy share in national electricity generation by 2030 through expanded hydro, solar, and demand-side management investments.

The NDC reflects Nigeria's dual development and climate objectives, recognizing the need to pursue emissions reductions in a manner that supports economic growth, energy access expansion, poverty alleviation, and industrial development.

### 3.2 Role of the Energy and Power Sector in Nigeria's NDC

The energy sector is identified in Nigeria's NDC as the second largest source of mitigation potential, reflecting the dominance of fossil fuels in electricity generation and the widespread use of diesel and petrol generators

[13]https://unfccc.int/sites/default/files/2025-09/Nigeria%20NDC%203.0%20%20Transimission%20Version%202.pdf

for captive power generation. The NDC prioritizes the decarbonization of electricity supply through the accelerated deployment of renewable energy technologies (RETs), including utility-scale and distributed solar photovoltaic systems, small and large hydropower, wind energy, and sustainable biomass-based generation. These measures are complemented by policy actions aimed at reducing technical and commercial losses in the electricity network, improving the efficiency of thermal power plants, and enhancing system reliability to reduce reliance on self-generation.

Policy leadership for the implementation of NDC-aligned energy sector mitigation measures is vested in the Federal Ministry of Power (FMoP) Nigeria, in coordination with the Federal Ministry of Environment (FMEnv) Nigeria and National Council on Climate Change (NCCC) as the national focal point for climate change policy and reporting. Regulatory oversight and market design functions relevant to renewable energy deployment are exercised by the Nigerian Electricity Regulatory Commission (NERC), while grid integration and system operation functions fall under the mandate of the Transmission Company of Nigeria (TCN). Off-grid and mini-grid renewable energy deployment, which is particularly relevant for rural electrification and energy access objectives, is led by the Rural Electrification Agency.

### 3.3 Renewable Energy Targets and Commitments

NDC 3.0 articulates explicit ambitions to increase the share of renewable energy in the national electricity generation mix as part of a broader strategy to diversify energy supply, enhance energy security, and reduce the carbon intensity of economic growth. While specific quantitative renewable energy capacity targets are articulated in sectoral policy documents and national energy plans, the NDC integrates these ambitions within a broader mitigation framework that emphasizes renewable energy deployment as a core mitigation lever. The prioritization of solar photovoltaic deployment reflects Nigeria's high solar resource potential and the scalability of solar technologies for both grid-connected and off-grid applications.

The NDC further emphasizes the role of decentralized renewable energy systems, including mini-grids and standalone solar home systems, in expanding electricity access to underserved and unserved populations. These interventions are expected to deliver mitigation benefits by displacing diesel-based generation while simultaneously contributing to socio-economic development outcomes, including improved health outcomes, educational attainment, and local economic activity. Implementation of these decentralized energy solutions is closely linked to programs coordinated by the Rural Electrification Agency and supported by regulatory frameworks developed by the Nigerian Electricity Regulatory Commission (NERC).

### 3.4 Alignment with National Development and Energy Policy Frameworks

NDC 3.0 is aligned with national development strategies and energy sector policy frameworks aimed at addressing structural constraints in the power sector, including inadequate generation capacity, grid bottlenecks, and high system losses. The NDC explicitly recognizes that achieving sustained emissions reductions in the energy sector requires complementary investments in transmission and distribution infrastructure, institutional reforms to improve sector governance, and measures to enhance the financial viability of the electricity market.

In this regard, the implementation of renewable energy commitments under the NDC is closely linked to ongoing power sector reforms led by the Federal Ministry of Power (FMoP) and the Nigerian Electricity Regulatory Commission (NERC), as well as investment programs targeting grid expansion and reinforcement implemented by the Transmission Company of Nigeria (TCN). The integration of renewable energy deployment with broader power sector reform objectives is intended to ensure that mitigation actions contribute to system reliability, cost reduction, and long-term sector sustainability, thereby increasing the likelihood of sustained policy implementation and private sector investment.

## 4. EXISTING POLICY, REGULATORY FRAMEWORK, AND EFFORTS TO PROMOTE RENEWABLE ENERGY IN NIGERIA

Nigeria has established a range of policy, regulatory, and institutional instruments to promote the development and deployment of renewable energy technologies as part of broader power sector reform and climate mitigation objectives. These instruments are intended to address structural barriers to private sector investment in renewable energy, improve energy access, enhance energy security, and contribute to the achievement of Nigeria's NDC under the Paris Agreement. However, the effectiveness of these instruments has been constrained by implementation challenges related to regulatory uncertainty, grid infrastructure limitations, sector liquidity constraints, and broader macroeconomic risks.

### 4.1 National Renewable Energy and Energy Efficiency Policy Framework

The National Renewable Energy and Energy Efficiency Policy (NREEEP) provide the overarching policy framework guiding the promotion of renewable energy and energy efficiency in Nigeria. The policy establishes strategic objectives for increasing the share of renewable energy in the national energy mix, diversifying electricity generation sources, and reducing the carbon intensity of energy supply. The NREEEP identifies solar, hydropower, wind, and biomass as priority renewable energy resources and outlines indicative targets for renewable energy deployment across grid-connected and off-grid segments.

Policy oversight and strategic direction for NREEEP implementation are led by the Federal Ministry of Power (FMoP) Nigeria in collaboration with the Federal Ministry of Environment (FMEnv) Nigeria to ensure alignment with national climate objectives and international reporting obligations under the UNFCCC. The policy framework also emphasizes the role of private sector participation in renewable energy project development, supported by regulatory reforms and targeted incentive mechanisms.

### 4.2 Regulatory Framework for Grid-Connected Renewable Energy

The regulatory environment for grid-connected renewable energy projects is primarily governed by NERC, which is the agency responsible for licensing power generation projects, approving tariffs, regulating power purchase agreements (PPAs), and establishing market rules. The regulatory framework allows independent power producers (IPPs) to develop renewable energy generation projects and sell electricity to off takers under long-term PPAs, subject to regulatory approval.

While the regulatory framework provides a legal basis for renewable energy investment, practical implementation has been constrained by protracted licensing and approval processes, uncertainty regarding tariff adequacy and cost-reflectivity, and challenges related to the creditworthiness of off-takers within the electricity market. These factors have increased perceived investment risk and contributed to limited financial close of utility-scale renewable energy projects. In addition, grid connection and evacuation constraints managed by the Transmission Company of Nigeria (TCN) has limited the ability of the system to absorb additional variable renewable energy capacity, particularly in regions with weak transmission infrastructure.

### 4.3 Off-Grid and Mini-Grid Regulatory Framework

Nigeria has made notable progress in establishing a supportive regulatory framework for off-grid and mini-grid renewable energy deployment, particularly in rural and underserved areas. The mini-grid regulatory framework developed by the NERC provides a clear legal and commercial basis for the development, licensing, and operation of mini-grid systems, including provisions for tariff setting, service quality standards, and compensation mechanisms in the event of grid arrival.

Implementation of off-grid renewable energy programs is led by the REA, which coordinates donor-supported and government-funded initiatives aimed at accelerating access to electricity through decentralized renewable energy solutions. These programs have supported the deployment of solar mini-grids and standalone solar systems, contributing to emissions reductions through the displacement of diesel-based generation and kerosene lighting. Despite these advances, scaling up off-grid deployment remains constrained by financing gaps, affordability challenges for end-users, and the need for sustained technical and institutional capacity at the subnational level.

### 4.4 Investment Incentives and Market Support Mechanisms

Nigeria’s renewable energy policy landscape includes a range of fiscal and non-fiscal incentives intended to improve the commercial viability of renewable energy investments. These include tax incentives, import duty exemptions for renewable energy equipment, and eligibility for government-backed support programs aimed at de-risking private sector investment. In addition, Nigeria has explored the use of procurement-based mechanisms, such as competitive tenders for renewable energy capacity, to attract private sector participation at scale.

However, the absence of a fully operationalized and bankable feed-in tariff or long-term revenue stabilization mechanism for renewable energy projects has limited the effectiveness of these incentives in catalysing large-scale private investment. Project developers continue to face challenges related to revenue certainty, currency convertibility risks, and the availability of long-term local currency financing, all of which increase the cost of capital and undermine project bankability.

### 4.5 Grid Infrastructure and System Integration Constraints

Grid infrastructure constraints remain a binding barrier to the large-scale integration of renewable energy in Nigeria. The transmission network operated by the TCN faces capacity limitations, high technical losses, and reliability challenges that constrain the ability of the system to evacuate power from new generation projects, including renewable energy plants. Distribution network constraints further limit the absorption of distributed generation in urban and peri-urban areas.

These infrastructure limitations have implications for the design and expected impact of renewable energy policy instruments, as grid constraints can significantly reduce the effective deployment potential of utility-scale renewable energy projects even in the presence of supportive policy and regulatory frameworks. Addressing these constraints requires coordinated investment planning across generation, transmission, and distribution segments, as well as reforms to strengthen system planning, dispatch, and operational coordination.

### 4.6 Institutional Coordination and Implementation Challenges

Effective implementation of renewable energy policies in Nigeria requires coordinated action across multiple institutions, including the FMoP, the Federal Ministry of Environment, the Nigerian Electricity Regulatory Commission, the Transmission Company of Nigeria, and the Rural Electrification Agency. In practice, institutional coordination has been constrained by fragmented mandates, overlapping responsibilities, and limited data sharing across agencies. These coordination challenges have impeded integrated planning and the systematic tracking of renewable energy deployment and associated emissions impacts.

Furthermore, capacity constraints within implementing institutions, particularly at the subnational level, have limited the pace of policy implementation and project development. Strengthening institutional capacity, clarifying mandates, and establishing formal coordination mechanisms are therefore critical enablers for the effective implementation of renewable energy policies and for the robust tracking of mitigation outcomes under the Enhanced Transparency Framework.

## 5. DESCRIPTION OF THE REFIT REGULATION

Nigeria does not currently operate a fully institutionalized and long-term feed-in tariff (REFIT) scheme comparable to those implemented in some peer countries[14]. Instead, the country's renewable energy support framework comprises a combination of regulatory provisions, procurement-based mechanisms, fiscal incentives, and donor-supported de-risking instruments that collectively function as de facto incentive mechanisms for renewable energy deployment. This section characterizes the design features, scope, and implementation modalities of Nigeria's renewable energy policy instruments in a manner consistent with the analytical structure applied in the ICAT Renewable Energy Guidance (REG).

### 5.1 Policy Objectives and Rationale

The overarching objective of Nigeria's renewable energy incentive framework is to accelerate the deployment of renewable energy generation capacity to diversify the electricity generation mix, reduce the carbon intensity of electricity supply, improve energy security, and expand access to affordable and reliable electricity. These objectives are aligned with Nigeria's NDC commitments under the Paris Agreement and are operationalized through policy leadership by the FMoP in coordination with the FMoE and regulatory oversight by the NERC.

The policy rationale for renewable energy incentives is further grounded in the recognition that renewable energy projects face higher upfront capital costs, longer development timelines, and elevated investment risks relative to conventional thermal generation in Nigeria's current market context. Incentive mechanisms are therefore intended to address market failures, reduce perceived and real investment risks, and improve the bankability of renewable energy projects to catalyze private sector participation at scale.

### 5.2 Scope of Eligible Technologies and Market Segments

Nigeria's renewable energy incentive mechanisms cover a range of technologies and market segments, including utility-scale solar photovoltaic, small and large hydropower, onshore wind, biomass-based power generation, and decentralized renewable energy systems such as solar mini-grids and standalone solar home systems. Utility-scale projects are subject to licensing and tariff approval processes administered by the NERC, while decentralized systems are supported through regulatory frameworks and programmatic interventions led by the REA.

[14] https://www.mondaq.com/nigeria/renewables/1175982/regulating-renewable-energy-in-nigeria?utm

The differentiation between grid-connected and off-grid market segments reflects the distinct investment and regulatory challenges associated with each segment. Utility-scale renewable energy projects face grid connection and evacuation constraints managed by the TCN, as well as market liquidity risks associated with off-taker creditworthiness. In contrast, off-grid renewable energy systems face demand risk, affordability constraints among end-users, and the need for innovative financing and business models to achieve commercial sustainability.

### 5.3 Tariff Structures, Revenue Certainty, and Contractual Arrangements

In the absence of a standardized feed-in tariff, revenue certainty for renewable energy projects in Nigeria is primarily achieved through bilateral PPAs negotiated between project developers and off-takers, subject to regulatory approval by the NERC. These PPAs typically establish fixed or semi-fixed tariffs over a defined contract tenor, with tariff levels intended to reflect project costs, financing conditions, and risk profiles.

However, the bankability of PPAs has been undermined by concerns regarding off-taker creditworthiness, payment delays, and the absence of robust credit enhancement mechanisms. As a result, developers and financiers often require additional risk mitigation instruments, such as partial risk guarantees, political risk insurance, or sovereign-backed support mechanisms, to reach financial close. The lack of standardized, long-term, and predictable tariff mechanisms comparable to a feed-in tariff has therefore constrained the take-off of utility-scale renewable energy deployment.

### 5.4 Institutional Roles and Responsibilities

The design and implementation of renewable energy incentive mechanisms in Nigeria involve multiple institutions with complementary mandates. The FMoP provides strategic policy direction and coordinates power sector reform initiatives. The FMoE ensures alignment of renewable energy policies with national climate commitments and reporting obligations under the UNFCCC. NERC regulates tariffs, licensing, and market rules applicable to renewable energy projects, while the TCN is responsible for grid planning, connection approvals, and system operation. The Rural Electrification Agency (REA) leads the implementation of decentralized renewable energy programs targeting unserved and underserved communities.

The multiplicity of institutional actors underscores the importance of effective coordination mechanisms to ensure coherence in policy design, regulatory implementation, and data reporting. Fragmentation in institutional responsibilities has contributed to delays in project approvals, inconsistencies in policy implementation, and challenges in systematically tracking renewable energy deployment and associated mitigation outcomes.

### 5.5 Implementation Barriers and Risks

Despite the presence of policy and regulatory frameworks intended to promote renewable energy deployment, several structural barriers continue to limit the effectiveness of Nigeria’s renewable energy incentive mechanisms. These include high cost of capital driven by macroeconomic risks and foreign exchange volatility, limited availability of long-term local currency financing, grid infrastructure constraints, and the financial fragility of the electricity market. In addition, regulatory uncertainty and changes in policy priorities have contributed to potential renewable energy investor perceptions of heightened policy risk.

These barriers have important implications for the expected impact of renewable energy policies under the ICAT assessment framework, as they constrain the maximum feasible deployment of renewable energy capacity even in the presence of supportive policy intent. Addressing these barriers requires a combination of policy reforms, targeted de-risking instruments, grid infrastructure investments, and strengthened institutional capacity to implement and enforce renewable energy support mechanisms in a predictable and transparent manner.

# 6. EX-ANTE BASELINE SCENARIO

This section presents the ex-ante baseline scenario for Nigeria's electricity sector. This section focuses on the projected evolution of renewable electricity investment, generation capacity, generation mix, and associated GHG emissions. It focuses on those factors in the absence of additional renewable energy policy interventions beyond those already enacted and effectively implemented at the time of this assessment. The baseline scenario represents the construction of grid-connected open cycle gas turbine or off-grid diesel power generation as well as hydropower plants. Absent the renewable energy intervention, by 2030 the installed capacity will be approximately 90% open cycle and combined cycle gas power plants as well as approximately 10% hydropower plants. The baseline scenario provides the counterfactual case against which the incremental impacts of renewable energy policy instruments are assessed in subsequent sections. This assessment is in line with the methodology of the Initiative for ICAT. The baseline reflects existing policies, prevailing market conditions, and non-policy drivers of electricity demand growth, as well as structural constraints within Nigeria's power sector.

## 6.1 Non-Policy Drivers Included and Excluded

The baseline scenario incorporates a range of non-policy drivers that influence the trajectory of electricity demand and generation in Nigeria. These drivers include demographic trends, macroeconomic growth, urbanization, industrial development, and electrification efforts. Population growth and urban expansion are assumed to drive sustained increases in residential electricity demand, while economic growth is expected to increase electricity consumption in the industrial and commercial sectors. These demand drivers are informed by national demographic and economic projections produced by the National Bureau of Statistics (NBS) Nigeria and sectoral planning assumptions used by the Federal Ministry of Power (FMoP) Nigeria in power sector development planning.

The baseline further assumes the continuation of current patterns of electricity supply, including the dominance of gas-fired generation within the grid-connected power system and the widespread use of diesel and petrol generators for captive power generation by households and businesses which include commercial buildings, government institutions, non-government institutions particularly large and international NGOs. Structural inefficiencies and barriers in the power sector, including high technical and commercial losses, constrained grid capacity, and limited reliability of grid supply, are assumed to persist in the absence of major structural reforms beyond those already underway.

Non-policy drivers explicitly excluded from the baseline include transformative technological breakthroughs, major shifts in international energy prices beyond historical trends, and large-scale structural reforms to the electricity market that are not yet operationalized. The baseline does not assume the rapid deployment of large-scale energy storage, smart grid technologies, or major expansions in transmission capacity beyond projects already financed and under implementation by the Transmission Company of Nigeria (TCN).

## 6.2 Indicators and Data Used

The baseline scenario is constructed using a set of quantitative indicators reflecting the structure and performance of Nigeria's electricity sector. Key indicators are as shown in the table 1 below.

**Table *1*:: Baseline Indicators**

| S/N | Indicators |
|---|---|
| **1** | Installed generation capacity by technology:<br>1. Gas and<br>2. Large hydropower |
| **2** | Annual electricity generation by source |
| **3** | Electricity demand growth by sector |
| **4** | Grid losses |
| **5** | share of off-grid generation in total electricity supply |

Also, emissions indicators include total GHG emissions from grid-connected electricity generation and estimated emissions from captive diesel generation.

Primary data sources include electricity sector statistics and regulatory reports published by the NERC, generation and transmission system data from the TCN, and electrification and off-grid deployment data from the REA. National energy balances and macroeconomic indicators are sourced from publications of the NBS, while emissions factors and methodological guidance are aligned with national GHG inventory practices coordinated by the Federal Ministry of Environment (FMoE) for reporting to the UNFCCC.

## 6.3 Challenges and Data Gaps

The development of a robust ex-ante baseline scenario for Nigeria is constrained by several data and institutional challenges. Data availability and consistency across institutions remain limited, with discrepancies observed between generation, transmission, and distribution statistics reported by different agencies. The prevalence of informal and unmetered electricity consumption, particularly in off-grid and peri-urban contexts, introduces uncertainty into demand estimates and emissions calculations.

The widespread use of captive diesel generation is insufficiently captured in official electricity statistics, resulting in potential underestimation of baseline emissions and the mitigation potential associated with the displacement of self-generation through renewable energy deployment. Furthermore, limited historical time series data on renewable energy performance, particularly for decentralized systems, constrain the robustness of trend analysis and forward projections. Institutional fragmentation and limited data sharing protocols across the FMoP, NERC, TCN and REA further complicate the compilation of harmonized baseline datasets.

## 6.4 Resulting Baseline Scenario

Under the baseline scenario, Nigeria's electricity generation mix is projected to remain dominated by gas-fired power generation over the assessment period, with incremental additions of large hydropower capacity reflecting projects already under development. Renewable energy deployment beyond large hydropower is assumed would grow at a modest pace, driven primarily by decentralized solar installations and donor-supported off-grid programs coordinated by the Rural Electrification Agency, but without a transformative scale-up in utility-scale renewable energy capacity.

Total electricity demand is projected to increase steadily in line with population growth and economic development, while structural constraints in grid infrastructure and market liquidity are assumed to limit the pace of capacity expansion. As a result, reliance on captive diesel generation is projected to remain significant, particularly among commercial and industrial consumers. The baseline emissions trajectory therefore reflects a gradual increase in power sector GHG emissions over time, with emissions intensity declining only marginally due to incremental efficiency improvements in gas-fired generation and limited penetration of low-carbon generation technologies.

Figure 2 shows the energy generated in the country from 2020 – 2024 which shows drop in 2022 and 2024. This is triggered majorly by challenges in the gas supply chain which further buttresses the need for sustainable renewable energy power plants in the country. While the gas power plants is considered to be able to provide consistent supply, the hydro has been the major source of baseload in the country.

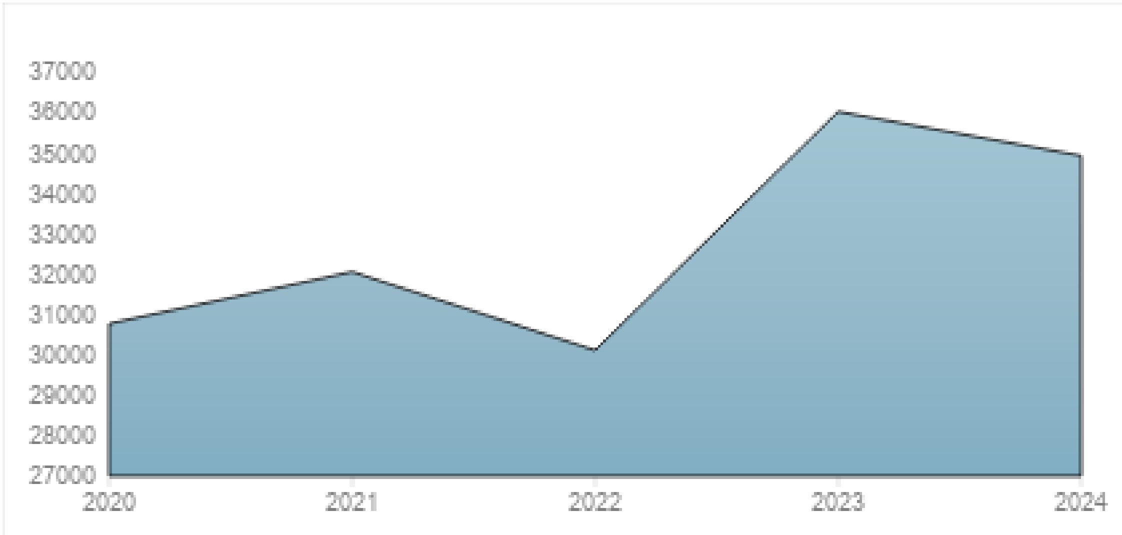


**Figure 2: Electricity generation in Nigeria from 2020 to 2025 (in gigawatt hours)**

In Figure 3, below, the installed capacity in the country did not grow significantly. However, there was noticeable increment growth in hydro power and gas power plants. While there has been substantial growth in off-grid and mini-grid solar power plants, there is no solar power plant currently connected to the grid. The national grid is supplied by approximately 86% from gas power plants, and 14% from hydro power plants.

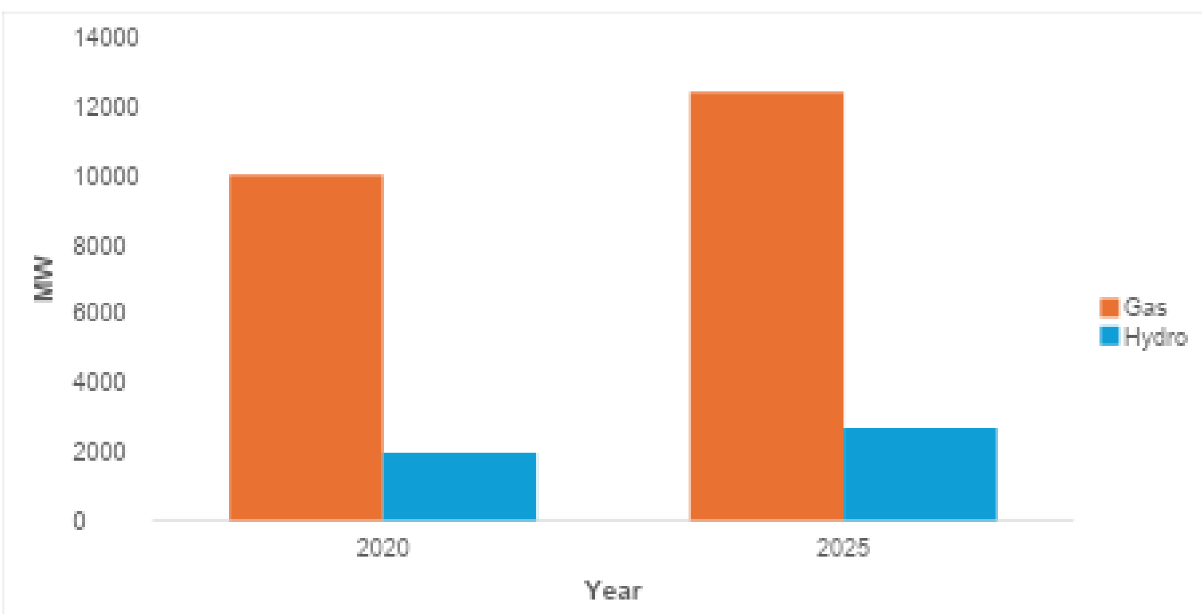

**Figure 3: Historical installed capacity by type (MW) for the Baseline scenario**

The NDC scenario suggests that 48 - 52% of the power plants by 2030 is expected to derive from renewable energy sources. The expectation is to have hydro and solar power plants as the two sources of renewable energy plants. Gas power plants are expected to continue to dominate the grid taking advantage of the abundance of gas supply in the country.

The Energy Transition Plan in the country expects aggressive domination of the grid with solar power plants[15]. It is expected that as the economy grows and population increases, the sub-nationals will build solar power plants, waste to energy/biomass power plants that will be connected to the grid. Hydro power resources in the country suggests that about 15GW power plants is possible but the conservative capacity expected on the grid is 11GW by 2060. Gas power plants in the country are expected to peak around 2045 and begin to be decommissioned and replaced by Hydrogen fuelled power plants. Figure 4 below shows that renewable energy power plants will be about 226 GW by 2060.

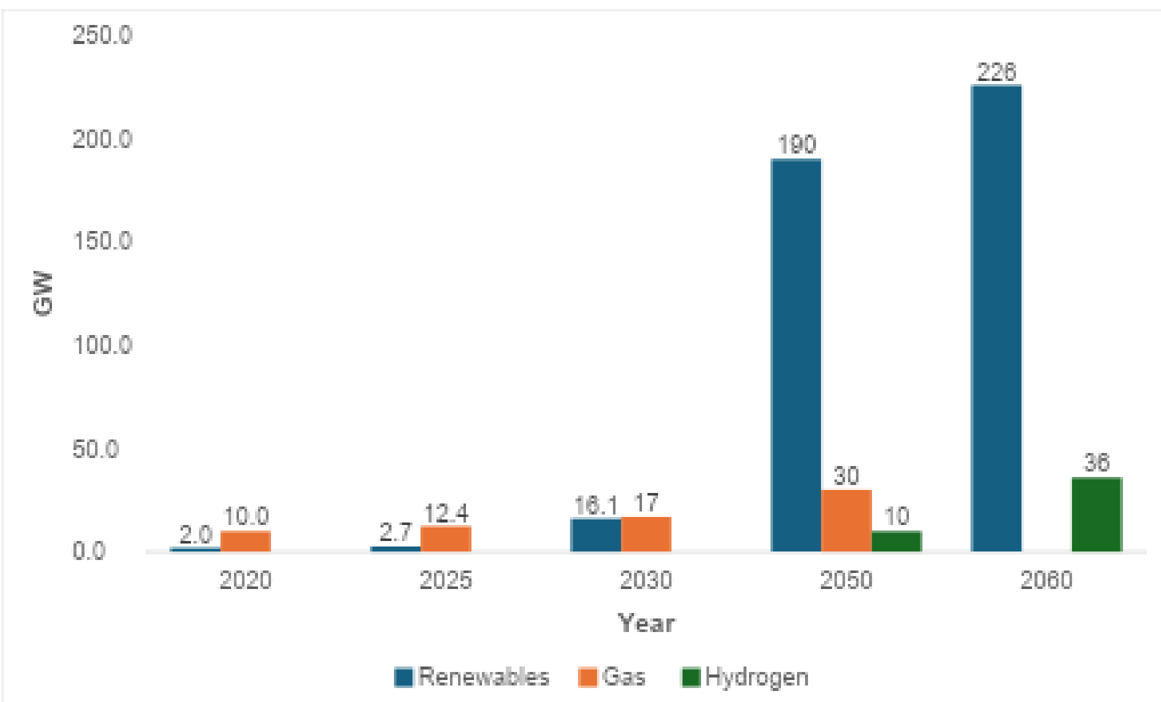


**Figure 4: Upcoming actions and projects included in the NDC and ETP scenario**

[15] https://energytransition.gov.ng/#

## 7. THE RENEWABLE ENERGY ADDITION OF THE POLICY EX-ANTE

This section estimates the ex-ante renewable energy (RE) capacity additions attributable to the implementation of Nigeria’s renewable energy policy instruments, relative to the baseline scenario described in section 6. The analysis assesses the maximum feasible deployment potential under the policy framework, the influence of policy design characteristics on expected outcomes, key barriers to full implementation, and the financial feasibility of renewable energy investments within Nigeria’s current market context. The assessment follows the methodological guidance of the Initiative for ICAT and is aligned with Nigeria’s NDC mitigation objectives reported to the UNFCCC.

### 7.1 Maximum Implementation Potential

Analysis estimates that utility-scale solar photovoltaic could account for the largest share of incremental RE additions over the assessment period (2020 – 2060), supplemented by incremental hydropower additions and modest contributions from wind and biomass-based generation. The pace of grid connected RE deployment is constrained by transmission evacuation capacity and grid stability considerations managed by the TCN, particularly in regions with weak transmission infrastructure.

In parallel, decentralized RE systems are projected to account for a significant share of incremental capacity additions, driven by mini-grid and standalone solar deployment programs coordinated by the REA. These systems are expected to contribute meaningfully to capacity additions and electricity access, although their contribution to grid-connected generation and large-scale emissions displacement remains relatively modest compared to utility-scale projects.

### 7.2 Effect of Policy Design Characteristics

The design characteristics of Nigeria’s renewable energy incentive framework play a critical role in shaping expected deployment outcomes. The absence of a standardized, long-term feed-in tariff mechanism comparable to fully institutionalized REFIT schemes in peer countries reduces revenue certainty for project developers and financiers, thereby constraining the scale and pace of investment. Instead, reliance on bilateral power purchase agreements approved by the NERC introduces project-specific negotiation risks, protracted timelines, and uncertainty regarding tariff adequacy and bankability.

Policy design features that positively influence deployment include the existence of a dedicated regulatory framework for mini-grids, streamlined licensing processes for small-scale projects, and targeted donor-supported de-risking instruments for off-grid deployment coordinated by the REA. However, the lack of standardized contractual templates, limited availability of credit enhancement mechanisms, and exposure to foreign exchange risk continue to undermine investor confidence in utility-scale renewable energy projects. The absence of an integrated renewable energy procurement roadmap aligned with grid expansion planning further constrains the predictability of the project pipeline and limits economies of scale in project development.

### 7.3 Barriers to Full Implementation

Several structural barriers constrain the realization of the maximum implementation potential identified above. Grid infrastructure limitations remain a primary binding constraint, with transmission congestion, limited substation capacity, and system reliability challenges restricting the ability to evacuate power from new renewable energy plants. Market liquidity constraints and the weak creditworthiness of off takers further increase perceived counterparty risk, raising the cost of capital and delaying financial close for bankable projects.

The Nigeria electricity industry is principally governed by the following institutions: the Federal Ministry of Power (FMoP), Nigeria Electricity Regulatory Commission (NERC), Nigeria Bulk Electricity Trading Company (NBET), Transmission Company of Nigeria (TCN) and Rural Electrification Agency (REA). The FMoP are responsible for policy formulation in the power industry while NERC is the regulator for the industry. NBET is responsible for coordinating the bulk sales of the electricity produced by the generating companies (GenCos) and the TCN is responsible for sales of electricity in the industry. REA supports electricity generation in rural areas, underserved and unserved areas. It also coordinates the mini grids and off grids which are mostly in rural areas of the country.

Regulatory and institutional barriers include protracted approval processes, limited inter-agency coordination among the Federal Ministry of Power (FMoP), Nigeria Electricity Regulatory Commission (NERC), Transmission Company of Nigeria (TCN) and Rural Electrification Agency (REA), and limited technical capacity for project appraisal and grid integration planning. Macroeconomic risks, including foreign exchange volatility and limited access to long-term local currency financing, further constrain the commercial viability of capital-intensive renewable energy investments.

Social and land-use considerations, including land acquisition processes and community engagement requirements, can introduce additional delays and costs for utility-scale projects, particularly in locations of sub-nationals with complex land tenure arrangements. These barriers collectively reduce the effective deployment potential of renewable energy under the current policy framework relative to the country's technical resource potential.

### 7.4 Financial Feasibility and Cost Assumptions

Cost and performance assumptions are informed by international benchmarks reported by the IRENA and adapted to reflect Nigeria-specific financing terms, risk premiums, and balance-of-system costs. In the absence of robust revenue stabilization mechanisms, project developers require higher tariffs to achieve commercial viability, which in turn constrains regulatory approval and off-taker willingness to contract for renewable energy at scale.

It should be noted that the financial feasibility of RE technologies is usually presented in the literature using economic indicators such as LCOE, net present cost (NPC), investment cost, and operating cost. LCOE is one of the powerful economic indicators that helps the policy and decisionmakers with technology selection and decision support for electricity projects. It helps in assessing the economic viability and compares the competitiveness of the cost of different technologies easily, considering as inputs the capital expenditure, incentives, O&M costs, and fuel costs. The LCOE is calculated using Equation 1.

$$LCOE \quad \frac{Sum\ of\ costs\ over\ lifetime}{Sum\ of\ electrical\ energy\ production\ over\ lifetime} = \frac{\sum_{t=1} \frac{}{(1+r)^t}}{\sum_{t=1}^{n} \frac{E^t}{(1+r)^t}}$$

**Equation 1**

Where It is capital expenditures (CAPEX) in year t, Mt represents the operation and maintenance expenditures in year t, Ft is the fuel expenditures in year t, Et represents the electrical expenditures in year t, r is the discount rate, and n is the lifetime of the project.

According to the IRENA, between 2010 and 2017, the global weighted average LCOE for solar registered considerable fall from 0.36 $/kWh to 0.10$/kWh. Despite the mature nature of biomass and geothermal technologies, they present lower potential for cost reductions compared to solar and wind technologies. For the same period, the LCOE of biomass and geothermal varies between 0.06$/kWh to 0.07$/kWh, and 0.05$/kWh to 0.07$/kWh, respectively, as show in the graph below.

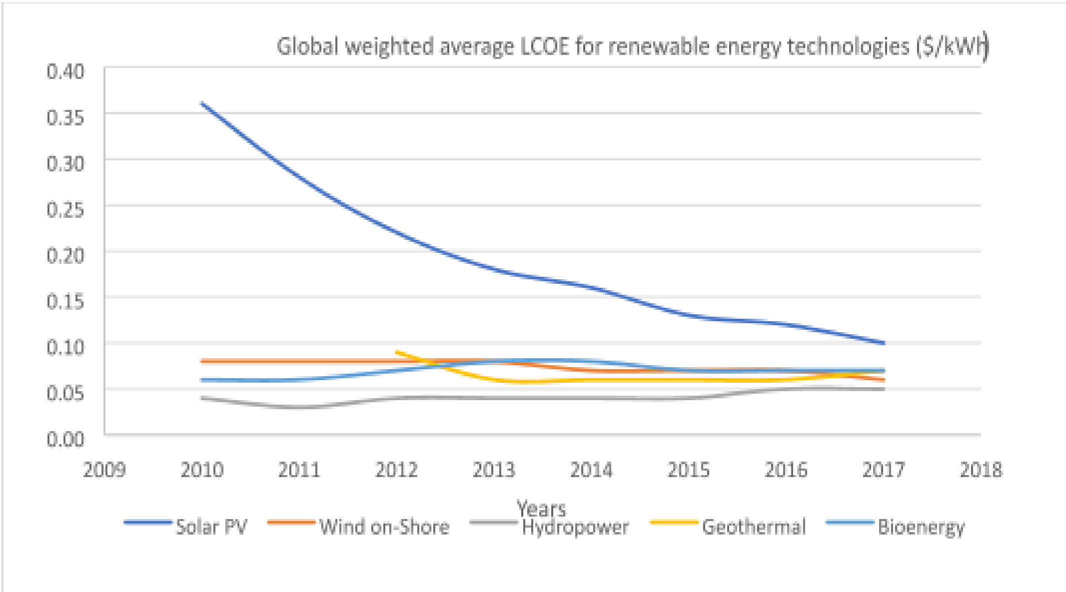


**Figure 5: Global weighted average LCOE for renewable energy technologies.**

**Source: IRENA Renewable Cost Database**

The LCOE varies by region and country, technology, maturity of the market, considering the RE local resources, capital, replacement, operating and maintenance costs of each component of the systems throughout the lifetime, fuel price, lifetime of the components of the system, as well as the performance of the technology. Hence, the combination of these factors determines how financially feasible RE technologies are in a given country context.

# 8. THE REFIT POLICY SCENARIO

## 8.1 Method

The assessment applies a comparative scenario approach, in which a REFIT policy scenario is compared against a BAU baseline scenario representing continuation of current trends in renewable energy deployment and electricity generation. The BAU scenario assumes limited uptake of REFIT-supported projects due to prevailing institutional, financial, and grid constraints, while the REFIT policy scenario reflects implementation of the REFIT regulation under current market and regulatory conditions.

The analytical framework covers on-grid and off-grid electricity generation in Nigeria and focuses on renewable energy technologies eligible under the REFIT regulation, including solar PV, small hydropower, biomass, and wind. Electricity generation and emissions outcomes under the REFIT policy scenario are estimated over the assessment period 2025–2035 and compared with BAU outcomes to quantify incremental renewable energy deployment and avoided GHG emissions attributable to REFIT implementation.

Institutional data inputs and policy assumptions are based on official power sector sources coordinated by NERC and the ECN, in collaboration with relevant power sector stakeholders.

## 8.2 Indicators and data used

The assessment applies a set of indicators consistent with ICAT Renewable Energy guidance and aligned with Nigeria's NDC 3.0 mitigation targets for the electricity generation sub-sector. These indicators are used to quantify the impacts of REFIT implementation on renewable energy deployment, electricity generation mix, and GHG emissions.

| Sector: Energy | |
|---|---|
| **Fuel Combustion - Energy Industries - Electricity Generation** | |
| **Measure 1** | Increase the share of renewable energy in electricity generation |
| **Action** | Achieve 52% of on-grid and off-grid generation capacity from renewable energy sources through installed capacities of 10,400 MW Hydro, 5,700 MW Solar, 17,000 MW Gas, 2,500 MW DSM |
| **Mitigation potential** | 12.220 Mt $CO_2$ e |
| **Measure 2** | Implement Energy Efficiency measures in the electricity sector |
| **Actions** | 1. Replace 100% diesel and single cycle steam turbines with combined cycle ones by 2030<br>2. Transition to improved Minimum Energy Performance Standards for energy-efficient air conditioning and refrigeration equipment in residential, commercial and public buildings<br>3. Review and update the National Building Code (NBC) to integrate energy efficiency and climate resilience, with clear provisions for adoption in all states |
| **Mitigation potential** | Action 1: 5.018 Mt $CO_2$ e, Action 2: 6.229 Mt $CO_2$ e, Action 3: Not estimated |

**Figure 6: Actions and projects included in the NDC mitigation scenario**

Key indicators applied in the assessment include:

- Installed renewable energy capacity by technology (MW);
- Renewable electricity generation by technology (GWh);
- Share of renewable energy in total electricity generation (%);
- Displacement of fossil fuel-based electricity generation (GWh), including gas and diesel.
- Avoided GHG emissions attributable to REFIT-supported renewable electricity generation ($tCO_2e$).

**Table 2: Key indicators and data sources for assessing the REFIT policy scenario in Nigeria**

| **NDC Scenario** | **Renewables** | **Source** |
|---|---|---|
| Measures | Achieve 52% of on-grid and off-grid generation capacity from renewable energy sources | NDC 3.0 |
| Hydro | 10,400 | NDC 3.0 |
| Solar | 5,700 | NDC 3.0 |
| Gas | 17,000 | NDC 3.0 |
| **TOTAL** | **33,100** | |
| **NDC Scenario** | **Energy Efficiency** | |

| | | |
|---|---|---|
| Measure | 1. Replace 100% diesel and single cycle steam turbines with combined cycle ones by 2030<br>2. Transition to improved Minimum Energy Performance Standards for energy-efficient air conditioning and refrigeration equipment in residential, commercial and public buildings<br>3. Review and update the National Building Code (NBC) to integrate energy efficiency and climate resilience, with clear provisions for adoption in all states | NDC 3.0 |
| **ETP Scenario** | **Renewables** | **Source** |
| Measures | ● Electricity generation increases by **6.5 times** between 2020-2060, with an annual growth rate of 32% due to **universal electrification** in 2030<br>● Oil and gas **decentralized** generators replaced by **centralized technologies** due to achievement of universal electrification in 2030 and decarbonization objective in 2060<br>● Significant uptake of **solar PV** in 2060 of 446 TWh due to replacement of gas to achieve net zero emissions<br>● Increase of **biomass** reaching to 32 TWh in 2060 in replacement of gas and need of dispatchable power<br>● Increase of **hydropower** generation, 39 TWh in 2060 and **hydrogen** of 4 TWh due to limited fossil fuel generation and need of dispatchable power<br>● Increased penetration of **battery storage** (0.5 TWh) and **hydrogen storage** (0.14 TWh) for security of supply due to increased penetration of renewables and hydrogen | Nigeria Energy Transition & Investment Plan Update (2024)<br><br>https://www.seforall.org/system/files/2025-05/Nigeria-ETIP-u.pdf |

## 8.3 Challenges and gaps

Implementation of the REFIT policy scenario in Nigeria faces several structural and operational challenges that constrain renewable energy deployment and the resulting mitigation outcomes. These challenges create gaps between the policy objectives of the REFIT regulation and actual on-the-ground outcomes.

**Key challenges and gaps include:**

- **Institutional and regulatory challenges:**

Fragmented institutional responsibilities across power sector agencies complicate REFIT implementation and monitoring. Delays in regulatory approvals, limited enforcement of priority dispatch provisions, and lengthy power purchase agreement negotiations increase project development timelines and transaction costs for developers.

- **Financial and market barriers:**

High cost of capital, foreign exchange risk, and concerns regarding the creditworthiness of electricity off-takers reduce investor appetite for REFIT-supported projects. Limited availability of long-term local currency financing constrains participation by domestic project developers and increases reliance on concessional finance.

- **Technical and infrastructure constraints:**

Transmission and distribution network limitations restrict the ability to integrate new renewable generation capacity, particularly in regions with high solar resource potential. Limited grid flexibility and reserve capacity increase the risk of curtailment of variable renewable energy, reducing the effective utilization of REFIT-supported capacity.

- **Data and MRV gaps:**

Data on renewable energy capacity, generation, and performance, particularly for embedded and off-grid systems, remain fragmented and incomplete. This constrains the ability to robustly track REFIT outcomes and integrate REFIT impacts into national GHG inventory and NDC tracking systems.

- **Policy coherence gaps:**

REFIT implementation is not always well coordinated with transmission expansion planning, distribution network upgrades, and broader power sector financial reforms. This limits the system-level effectiveness of REFIT and reduces the overall mitigation impact of renewable energy deployment.

# 9. THE RESULTING POLICY SCENARIO AND COMPARISON WITH VARIANT SCENARIOS

This chapter presents the results of the REFIT policy scenario for Nigeria and compares them with alternative variant scenarios. The analysis focuses on the impacts of REFIT implementation on renewable energy deployment, the electricity generation mix, and GHG emissions in the electricity generation sub-sector, as well as the contribution of REFIT to Nigeria's mitigation targets under the NDC 3.0. The results are presented relative to a BAU baseline scenario that reflects the continuation of current trends in renewable energy deployment and electricity generation in Nigeria.

Under the REFIT policy scenario, renewable energy capacity increases relative to BAU, driven primarily by additional deployment of solar PV and, to a lesser extent, small hydropower, and biomass. The REFIT framework improves the financial attractiveness of renewable energy projects and supports increased private sector participation in renewable electricity generation. However, the overall scale of renewable energy deployment remains constrained by grid integration limitations, financing conditions, and off-taker risks.

Electricity generation from renewable sources increases under the REFIT policy scenario, leading to a gradual increase in the share of renewable energy in the national electricity generation mix. Incremental renewable generation displaces marginal fossil fuel-based generation, primarily gas-fired and diesel-based generation in the BAU scenario, resulting in lower power sector GHG emissions relative to BAU. The magnitude of emissions reductions remains modest in the context of rapidly growing electricity demand and continued reliance on gas-fired generation to meet system reliability requirements.

Variant scenarios illustrate how changes in key enabling conditions influence the outcomes of REFIT implementation. Improvements in grid readiness and system flexibility enable higher integration of variable renewable energy and increase the effective utilization of installed renewable capacity, resulting in higher renewable electricity generation and larger emissions reductions relative to the REFIT policy scenario.

Improvements in financial conditions and investment risk profiles will increase private sector participation by reducing financing costs, mitigating foreign exchange risk, and improving the bankability of power purchase agreements, thereby accelerating project commissioning and increasing installed renewable energy capacity. Strengthened institutional coordination and monitoring frameworks improve the effectiveness and credibility of REFIT implementation by reducing project delays, clarifying regulatory processes, and strengthening the tracking and reporting of REFIT-supported projects, which enhances the integration of REFIT outcomes into national climate reporting and NDC tracking systems.

Across all scenarios, the contribution of REFIT to Nigeria's NDC 3.0 mitigation targets for increasing the share of renewable energy in electricity generation is positive but partial. While REFIT accelerates renewable energy deployment and reduces emissions relative to BAU, the scale of deployment achieved under REFIT alone is insufficient to deliver the full renewable capacity targets implied by Nigeria's NDC 3.0. Achieving materially higher mitigation outcomes in the electricity generation sub-sector will require REFIT to be implemented as part of a broader policy package that includes transmission and distribution network reinforcement, power sector financial reform, improved grid flexibility, and strengthened institutional and data systems coordinated by Nigerian Electricity Regulatory Commission (NERC) and the Federal Ministry of Power.

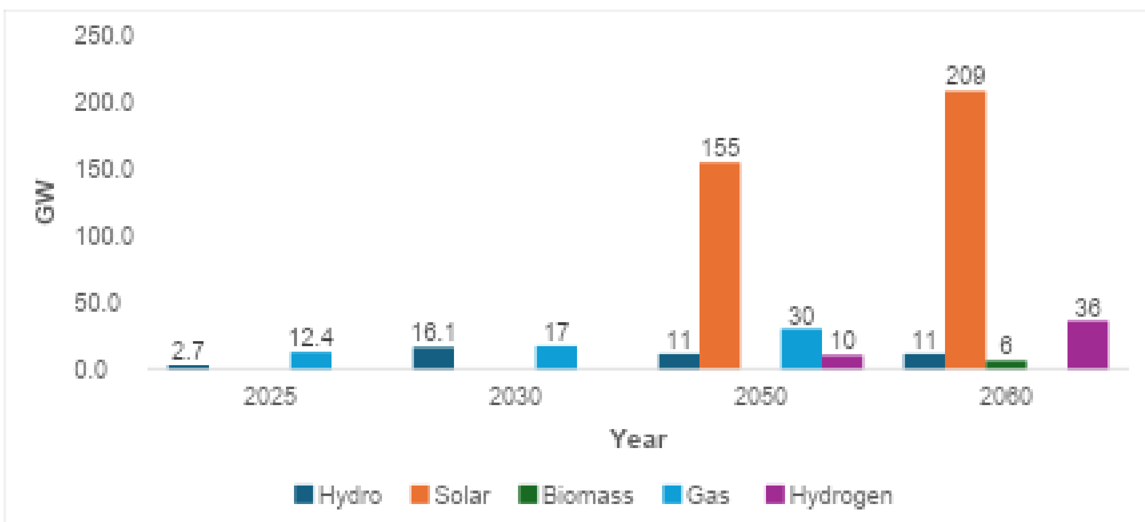


**Figure 7: Electricity generation by source under BAU and REFIT policy and variant scenarios, Nigeria 2025–2035**

Figure 7 shows the contributions of Hydropower, Solar and Biomass as the key sources of renewable power plants on the grid. The solar power plants are expected to be the highest contributor on the grid. It is anticipated that there would be much more improvement and innovations in solar technology in the next decades. Gas power plants are to be replaced by Hydrogen technology hence achieving the expected the net zero in power production by 2060.

The GHG emissions under the current scenario at the efficiency of the gas power plants on the grid, the fuel consumed and technology mix which include steam gas turbines, open cycle gas turbines, combined cycle gas turbines, the GHG emissions could be in excess of 400 MtCO2 including new gas power plants if the whole power plants in the country were to be gas built as shown in figure 8 below.

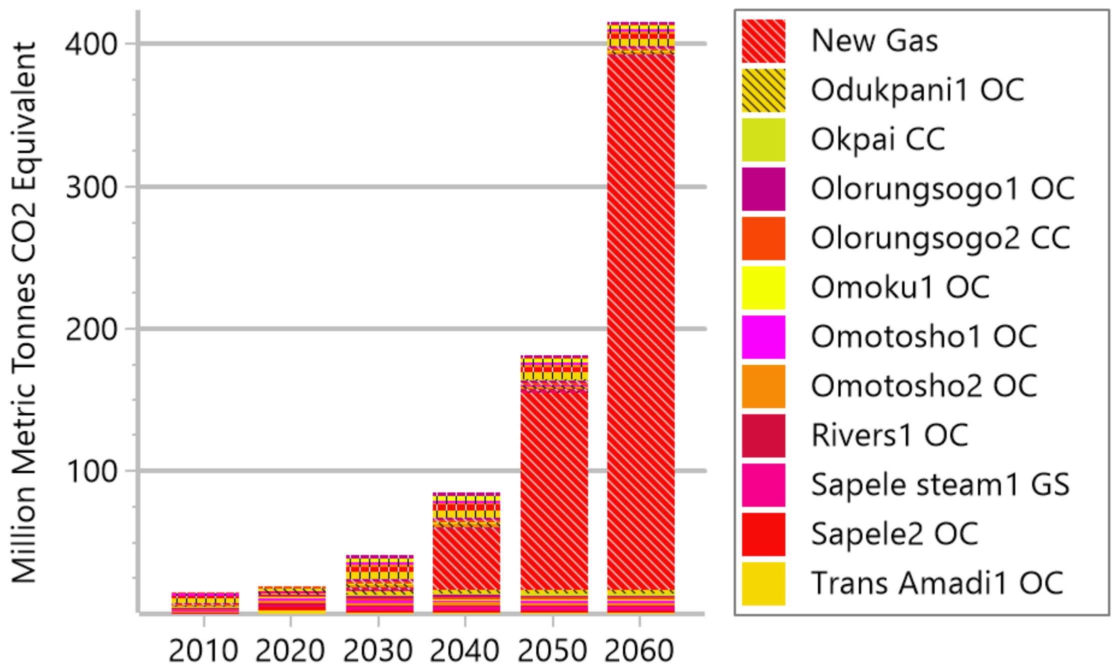


**Figure 8: BAU under the current scenario of efficiency, fuel consumption and technology mix**

However, should the BAU imply improving the efficiency of the gas power plants and having the hydro power plants considering they are both baseline power plants which would have been built absent the mitigation actions under the NDC (3.0) and ETP.

Figures 9 and 10 below show the impact of GHG emissions under the BAU (absent the RE policy) and with the NDC and ETP policies that drives aggressively the renewable energy technologies.

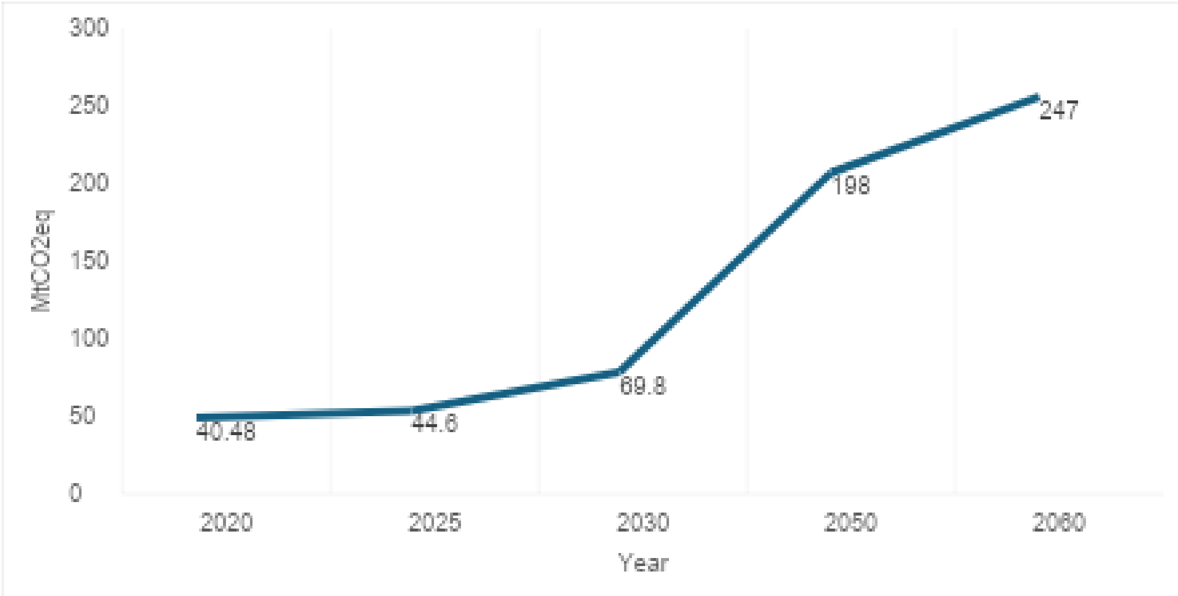


**Figure 9: Power sector GHG emissions under BAU assuming REFIT policy**

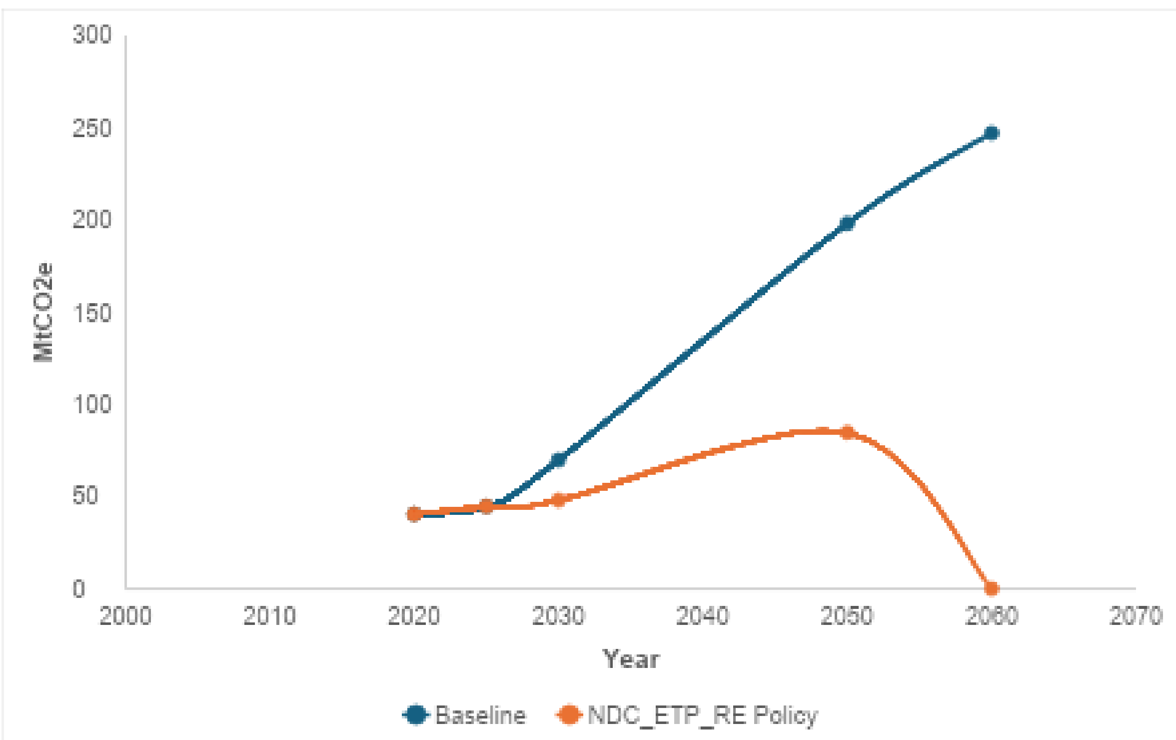


**Figure 10: Power sector GHG emissions under BAU and NDC_ETP under assumed REFIT (2020 – 2060)**

## 10. CONCLUSIONS AND RECOMMENDATIONS

### 10.1 Conclusions

This assessment evaluated the potential impacts of Nigeria's REFIT policy on electricity generation and GHG emissions in the power sector over the period 2020 – 2060 assuming the policy were fully implemented. Using scenario analysis, the study compared BAU trajectory with REFIT policy and variant scenarios to determine the extent to which accelerated deployment of renewable energy could contribute to Nigeria's climate mitigation objectives and broader energy transition goals.

The analysis demonstrates that the REFIT policy has the potential to play a meaningful role in transforming Nigeria's power generation mix by facilitating increased deployment of renewable energy technologies such as solar, small hydro, wind, and biomass. Under the policy scenario, renewable energy generation increases significantly relative to the BAU pathway, leading to a gradual reduction in the share of fossil-fuel-based generation in the national electricity mix. This transition supports Nigeria's long-term objective of diversifying its energy sources while improving electricity access and reliability.

From a climate mitigation perspective, the results indicate that the implementation of REFIT could lead to measurable reductions in power sector greenhouse gas emissions compared to the BAU scenario. By enabling the displacement of carbon-intensive generation sources, particularly diesel and natural gas-based generation, renewable energy expansion under REFIT contributes to lowering the emissions intensity of electricity generation. While the scale of emission reductions depends on the pace of policy implementation, grid integration capacity, and investment flows into renewable energy infrastructure, the policy clearly supports Nigeria's commitment to reduce emissions under its NDC.

In addition to climate benefits, the REFIT policy also offers broader socio-economic and energy system benefits. Increased renewable energy penetration can improve energy security by reducing dependence on fossil fuels and exposure to fuel price volatility. It can also stimulate local economic development through investments in renewable energy infrastructure, job creation in the clean energy sector, and increased electricity availability for productive uses. Furthermore, the expansion of renewable energy technologies can support decentralized electricity solutions, particularly in rural and underserved communities.

Despite these promising outcomes, the assessment also highlights several challenges that could affect the effective implementation and monitoring of the REFIT policy. One of the key constraints identified is the limited availability and consistency of sectoral data required for robust monitoring, reporting, and verification (MRV) of policy impacts. Data on electricity generation by technology, installed capacity additions, grid integration of renewable energy, and associated emission factors are often fragmented across multiple institutions. This fragmentation can complicate efforts to track the mitigation impact of renewable energy policies and to report progress transparently under international climate reporting frameworks.

Institutional coordination also remains a critical issue. Multiple agencies other sectoral stakeholders play roles in electricity market governance and renewable energy deployment. However, the absence of fully integrated data management and reporting systems can limit the efficiency of policy implementation and the tracking of emissions impacts.

Also, financial and regulatory barriers may slow the scale-up of renewable energy projects under the REFIT framework. These include challenges related to investor confidence, grid infrastructure limitations, tariff design, and long-term policy certainty. Addressing these barriers will be essential to ensure that REFIT achieves its intended impact in accelerating renewable energy deployment and delivering emissions reductions.

### 10.2 Recommendations

To enhance the effectiveness of the REFIT policy and strengthen its contribution to Nigeria's climate commitments and energy transition, several key actions are recommended.

i. **Strengthen data collection and management systems**

Reliable and consistent data are essential for monitoring renewable energy deployment and assessing the emissions impact of REFIT. Relevant institutions should establish standardized data collection and reporting frameworks for electricity generation, installed renewable capacity, and associated emissions factors. Developing centralized data repositories and harmonized reporting templates will improve transparency and support evidence-based decision-making. Digital platforms for electricity sector data management could also enhance real-time monitoring and facilitate more accurate emissions accounting.

ii. **Enhance MRV systems for policy impact assessment**

Nigeria should further strengthen its MRV framework for the power sector to ensure that mitigation outcomes from renewable energy policies are systematically tracked and reported. This could include the development of standardized methodologies for estimating emission reductions from renewable energy deployment, aligned with international transparency frameworks. Integrating REFIT monitoring into the broader national MRV architecture will improve the ability of the government to report progress toward its NDC targets under the ETF of the Paris Agreement.

**iii. Improve institutional coordination across the power sector**

Effective implementation of REFIT requires strong collaboration among sector institutions. Clear institutional roles and responsibilities should be established for renewable energy policy implementation, data management, and emissions reporting. Mechanisms for inter-agency coordination such as technical working groups or data-sharing agreements should be strengthened to ensure that information flows efficiently among relevant entities.

**iv. Strengthen regulatory and policy frameworks to attract investment**

The successful scale-up of renewable energy under REFIT will depend on creating a stable and predictable investment environment. Policymakers should continue refining tariff structures, regulatory guidelines, and contractual frameworks to enhance investor confidence. Transparent tariff determination mechanisms, long-term power purchase agreements, and streamlined project approval processes can help attract private sector participation and accelerate renewable energy deployment.

**v. Address infrastructure and grid integration challenges**

As renewable energy capacity increases, investments in grid infrastructure and system flexibility will become increasingly important. Expanding transmission capacity, improving grid management systems, and strengthening integration of variable renewable energy sources will help ensure that renewable electricity can be effectively absorbed into the national grid. Coordinated planning between renewable energy expansion and grid infrastructure development should therefore be prioritized.

**vi. Promote capacity building and technical expertise**

Capacity development across government institutions and regulatory bodies will be essential to support the implementation and monitoring of renewable energy policies. Training programs focusing on renewable energy technologies, emissions accounting, MRV methodologies, and data management systems can help strengthen institutional capabilities. Collaboration with academic institutions, international partners, and technical organizations can also support knowledge transfer and enhance local expertise.

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*Lastly, the main objective of this assessment is to apply the ICAT guidance on renewable energy (particularly in the electricity sector), to estimate GHG emission reduction of the renewable electricity feed-in tariff (REFIT) compared to what would have occurred in a baseline scenario, to determine the REFIT's potential contribution to meet the NDC's goals and RE targets. This study is timely for Nigeria as a country implementing its energy transition, and hence, REFIT policies if implemented, may help in attracting investments towards low-carbon initiatives.*

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