



# NIGERIA'S ENERGY TRANSITION PLAN REVIEW SERIES: The Power Sector



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## **FORWARD**

This review was written by Chinwendu Obed and Abel B.S. Gaiya, under the guidance of Ifeoma Malo. It was compiled using information from the Energy Transition Plan (ETP) official website as well as information from various stakeholder engagement within the power sector and news reports.

## NIGERIA'S ENERGY TRANSITION PLAN REVIEW SERIES: THE POWER SECTOR

### INTRODUCTION

During the COP26 Climate Change Summit held in Glasgow, in 2021, the President of Nigeria, President Mohammed Buhari, declared that the country would reach net zero emissions by 2060. He followed this up by assenting the Climate Change Bill to Law in 2021 and this formed the founding basis for developing the Energy Transition Plan (ETP) launched in 2022.

The Energy Transition Plan is a working document approved by the Federal Government of Nigeria and the Energy Transition Implementation Working Group chaired by Vice President Yemi Osinbajo (SAN). It highlights the scale of effort required to achieve the 2060 net zero target whilst also meeting the nation's energy needs.

The focus sectors of the ETP are power, transport, oil and gas, cooking and industry. These sectors are cumulatively responsible for 65% of greenhouse gas (GHG) emissions in Nigeria. It is important to note that the goal of the ETP is to tackle the current energy poverty issues in Nigeria and to address climate change.

### THE POWER SECTOR

Power is at the heart of the development of any nation. According to the report on the ETP, the power sector was responsible for the emission of 48 metric tons of carbon dioxide (MtCO<sub>2</sub>) in 2020.<sup>12</sup> It is largely driven by diesel and petrol generators used due to the insufficient generation and distribution capacity of the national grid; and the use of on-grid gas combustion in power plants, which contributes the greatest to the installed capacity of the national grid.<sup>3</sup>

Where the generating power of the grid is regarded insufficient for households, industries, transports and other power needing sectors, they have taken recourse to off grid solutions largely generated by diesel and petrol generators. According to energypedia, Nigeria operates on a self-generating capacity of 14GW small-scale diesel and petrol generators, and nearly half of all electricity consumed is self-generated.<sup>4</sup> This lays emphasis on the issue of energy poverty in the country, which 46% of the population falls into —equivalent to over 90 million out of a 200 million growing population. Where there is improved energy access in the country through modern off grid technologies, there would be less or no need for the use of self

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<sup>1</sup> <https://www.energytransition.gov.ng/power/>

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> <https://bit.ly/40JhhAB>

power generation through diesels and petroleum, which would result in carbon emission reduction.

To reach the current energy demand of over 200 million growing population, the operational capacity of the grid has to grow 6.7 times of the current 6GW (40.2GW).<sup>5</sup>

### Growth in Centralized Electricity Demand across Different Segments (Twh)

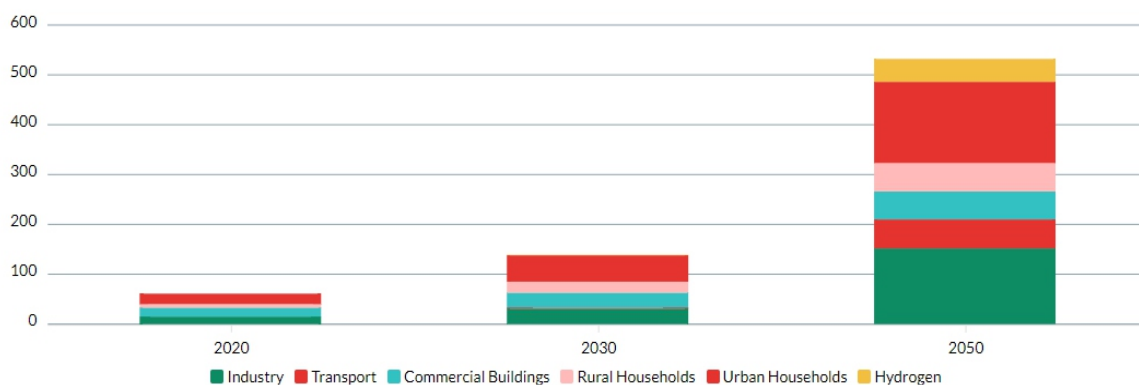


Image 1: Growth in Centralised Electricity Demand across Different Segments (Twh)<sup>6</sup>

The ETP has recognised that in order to increase energy access as well as reduce carbon emissions, there is need to reduce and eventually eliminate the use of diesel/petrol generators while promoting the expansion of off grid generating technologies (primarily solar). According to Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA) the average daily evacuation (depot truck out) from January to August 2022 stood at 67 million litres per day.<sup>7</sup> The NNPC also noted that an average of 68 million litres of petroleum is consumed by Nigerians daily to sustain.<sup>8</sup> The ETP argues that for a performative transition to take place, there is need to shift base load from backup generator to gas in the short term and eventually transit to clean energy production capacity tools such as hydro, biomass, solar and hydrogen.

<sup>5</sup> <https://www.energytransition.gov.ng/power/>

<sup>6</sup> <https://www.energytransition.gov.ng/power/>

<sup>7</sup> <https://bit.ly/3Kf4oHE>

<sup>8</sup> <https://bit.ly/40CKz3X>

### Centralized Production Capacity Growth (GW)

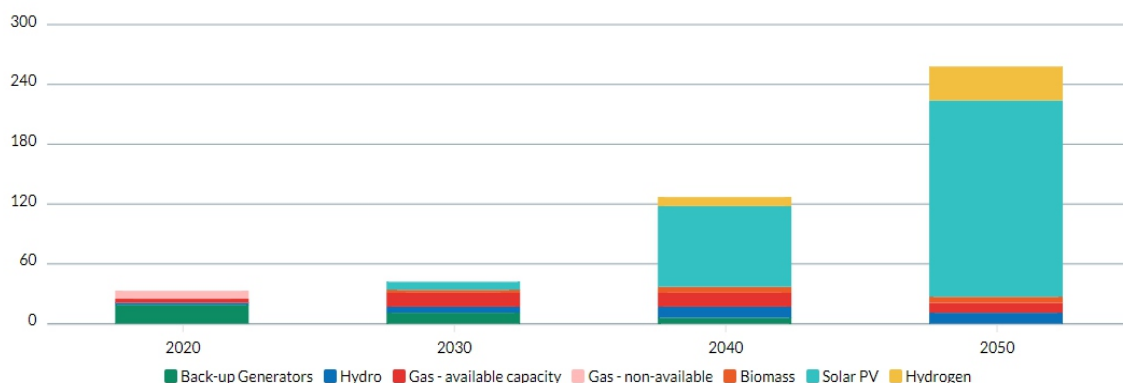


Image 2: Centralised Production Capacity Growth (GW)<sup>9</sup>

The ETP recognises that for most renewable energy modes, there should be a corresponding storage mode. Solar energy is generated from the sun which is produced mostly at the peak of the day; the energy generated during the day exceeds the immediate energy demand. In contrast, little or no energy is generated at night or during a change of weather to meet energy demand. There is a need to store the surplus energy generated at peak in order to meet the demand in times of deficit.

The ETP considers the installation of a 1GW storage capacity by 2030 and ramping it up to 90 GW storage capacity by 2050. The plan has also taken cognisance of hydrogen production by integrating electrolyzers with a 5GW capacity by 2040 and eventually reaching for a 22GW capacity by 2050.

### Centralized Storage Capacity Growth (GW)

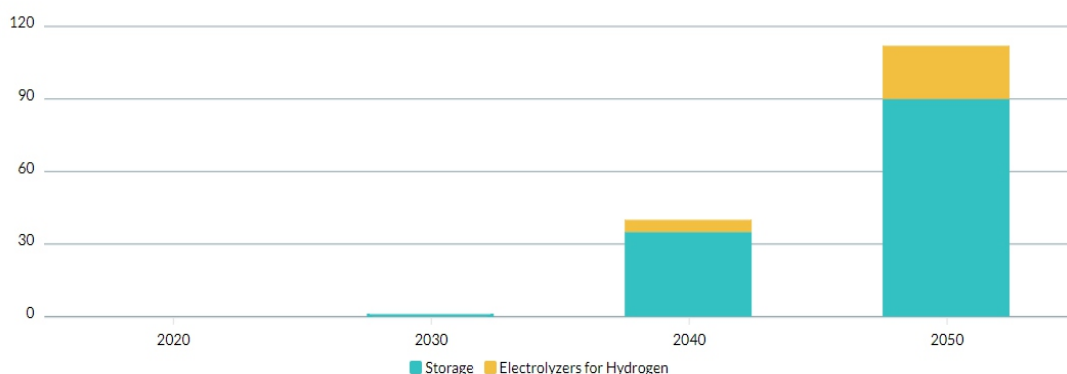


Image 3: Centralised Storage Capacity Growth (GW)<sup>10</sup>

<sup>9</sup> <https://www.energytransition.gov.ng/power/>

<sup>10</sup> Ibid.

## NIGERIA INTEGRATED ENERGY PLANNING TOOL FOR 2030

According to the SEforAll Geospatial Inception document, a least-cost technology mix can be used to electrify the currently unelectrified population. It was used by the Federal Government of Nigeria in 2019 through the Rural Electrification Agency. The document projects that a \$25.8 billion total nominal investment would be needed for universal access by 2030. The projected possible electricity connections from this would include:

- 5 million mini grid connections mostly in sparsely populated areas;
- 8.9 million mini-grid connections (approx. 104,800 mini-grids) in densely populated areas further from existing grid infrastructure; and
- 5.4 million Grid connections in densely populated areas within close proximity of existing grid infrastructure would be achievable.<sup>11</sup>

8400 GWh per annum and a 3.6 GW total electricity will also be supplied to unelectrified residential households. 106 million and 19.3 million additional people and residential households are expected to be reached, respectively.

### The overall electrification picture for Nigeria in 2030

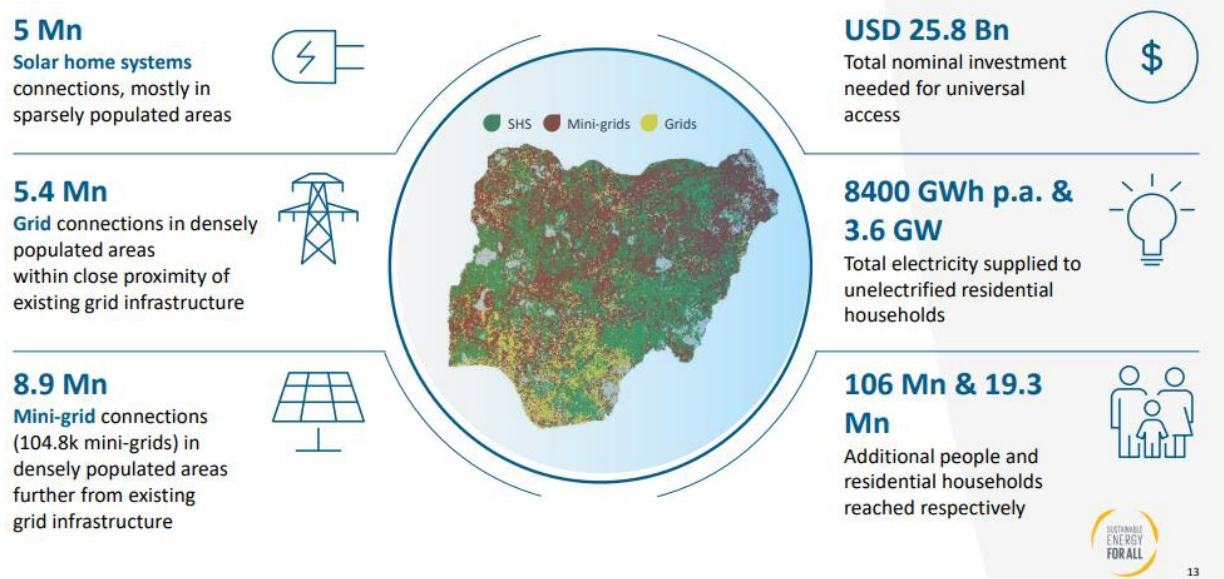


Image 4: The overall electrification picture for Nigeria in 2030<sup>12</sup>

<sup>11</sup> [https://www.seforall.org/system/files/2022-01/Nigeria\\_IEPT\\_Electrification\\_Report.pdf](https://www.seforall.org/system/files/2022-01/Nigeria_IEPT_Electrification_Report.pdf)

<sup>12</sup> Ibid. p. 13

## CHALLENGES WITH THE ETP

Certain concerns have been raised by stakeholders in workshops, seminars and discussions on the Energy Transition Plan. Below are some of such issues;



### Job displacement

Where job opportunities open up, there are concerns about displacement of already existing jobs especially in the oil and gas sector. This is a threat in cases where there is elimination of use of diesel, the production and sales level reduce. There is a need to secure the jobs of people providing services in the sector; from oil extraction upstream to generator distributors and retailers in ordinary marketplaces.

The ETP has a goal of creating 340,000 jobs by 2030 and 840,000 jobs by 2060. These jobs are projected to be driven by power, cooking and the transport sector. The power sector is projected to create 100,000 jobs by 2030 in addition to the 70,000 jobs as of 2020.<sup>13</sup> This brings to a total projection of 170,000 job creation in the power sector by 2030. The projection of 2050 stands at 420,000 jobs – this represents an additional 250,000 jobs between 2030 and 2050 in the power sector.<sup>14</sup>

These projections are feasible. In the Decentralised Renewable Energy (DRE) sector alone, Power for All reports that 50,000 people are employed, compared to 65,000 in Nigeria's oil and gas sector.<sup>15</sup> The projected increased demand for DRE products in the country is further expected to create more than 76,000 new jobs by 2023.<sup>16</sup> Many of these jobs will be filled by new entrants into the energy sector, but provisions must also be made for workers in the oil and gas and allied services sectors to be retrained and enjoy opportunities in the ETP-priority sectors.



### Revenue from oil and gas

In October, 2021, NNPC earned as high as 147 billion naira on the sale of diesel and petrol selling 1,098.17 million litres of Premium Motor Spirit (PMS) and 2.84 million of Automotive Gas Oil (AGO).<sup>17</sup> One of the challenges to achieving the energy transition would be the fear of loss of huge revenue generated from the sale of petrol and diesel.

This is partly why the ETP sees natural gas as a transition fuel, which would give the oil and gas sector time to diversify and divest. Additionally, for a country like Nigeria endowed with

<sup>13</sup> <https://energytransition.gov.ng/>

<sup>14</sup> Ibid.

<sup>15</sup> Power For All (Sept, 2022). Press Releases. Available at <https://bit.ly/3mBYKaF>

<sup>16</sup> Ibid.

<sup>17</sup> <https://punchng.com/nnpc-sells-n147bn-petrol-diesel-in-one-month/>



natural resources, it will only be expected that policymakers harness other resources to create a value chain and economic diversification that fit into the new world of energy. A viable example would be lithium used in the production of batteries for electric vehicles and inverters.



## Finance

One of the major challenges to the ETP's implementation is access to finance. According to estimates, the ETP will add \$410 billion to spending over business-as-usual levels. The entire expenditure for the power sector comes to \$285 billion with a breakdown of \$150 billion for production capacity and \$135 billion for necessary transmission and distribution facilities.<sup>18</sup>

The private sector and overseas investors have been collaborating on the ETP implementation's financial framework. Donors have supported the development of a geo-spatial planning tool to aid the implementation of the ETP. The Integrated Energy Planning Tool, which was developed by SE4All in collaboration with the Rockefeller Foundation and the Global Energy Alliance for People and Planet, was placed into context during the private sector roundtable that the ETO held.

Other efforts are being made to attract financing for the ETP. Nigeria engaged the G7 on November 12th, during COP27, to propose that Nigeria be added to the G7's Climate Partnerships List in order to collaborate on the creation of a Just Energy Transition Partnership.<sup>19</sup> The Middle East Energy Conference, held in March 2023, in Dubai also covered the ETP's financial goal. Although no express commitments were made, suggestions regarding the mode of investment as well as the difficult process and risk involved in foreign currency investment were raised. It is important that these issues be addressed in order to attract funding.<sup>20</sup>

Although the ETO has not publicly announced any financial commitments, the Office has not failed to mention its discussions with potential investors on a number of occasions. For instance, it observes that the World Bank is preparing to scale up commitment to the Nigerian energy transition with an additional \$1.5 billion of financing for the Nigeria Electrification Project (\$750 million) and Power Sector Recovery Operation (\$750 million), while considering other opportunities that will serve as the first partner contribution towards achieving the \$10 billion target by COP27.

<sup>18</sup> <https://www.seforall.org/nigerias-energy-transition-office-hosts-private-sector-roundtable>

<sup>19</sup> <https://tribuneonlineng.com/nigeria-delivers-national-statement-at-cop27/>

<sup>20</sup> <https://businessday.ng/nigeria's-energy-transition-plan-at-middle-east-energy-conference>





## Technological gap

There is a big technical gap in human capital and material availability to meet the energy needs of the entire nation. Most of the equipment and components used in the deployments of these off grid technologies are imported because there is a lack of human capacity and infrastructure to produce standard parts. This is one of the reasons why off grid technologies are expensive and the investment requirements are high.

The ETP consequently seeks to secure agreements with Original Equipment Manufacturers (OEMs) to begin the local manufacturing/assembly of key technologies such as electric vehicles, and decentralized solar systems in Nigeria by 2025.<sup>21</sup> It also envisages securing agreements for skills and knowledge transfer with private sector leaders, research institutions and other partners, with immediate focus on upskilling labour for the power and cooking sectors. Further efforts need to be put into creating space for technical training, manufacturing and basic repairs.



## Lack of incentives

The different taxes imposed on every component of an off grid system make it unaffordable for regular citizens interested in switching to renewable energy. If Nigeria considers power the bedrock of its development, incentives should be placed on increasing access to these components and reducing their costs. This will encourage investment and growth in the off grid market.

The ETP identifies a few incentives to promote the energy transition. This includes pioneer status available to companies involved in independent power generation which provides a tax holiday of an initial three-year period, renewable for an additional two-year period.<sup>22</sup> A Liquefied Petroleum Gas (LPG) Cylinder Manufacturing company, for instance, has been approved for the 'Pioneer Status' incentive. However, challenges in reducing import duties or enforcing import duty exemptions on solar equipment still persist.

<sup>21</sup> <https://www.energytransition.gov.ng/implementation/>.

<sup>22</sup> Ibid.

## CONCLUSION

The ETP has given priority to the transition away from diesel and petrol generators to cleaner sources of energy as a means of decarbonization. The goals set by the ETP have been referred to by many as an audacious document. However, it would take more than just a plan document to achieve a net zero in the power sector. Several additional measures need to be taken for this to occur:

- Enabling laws and policies are first the bedrock of any sector in Nigeria. In the power sector, a commendable job through the NERC has been done. The president has recently signed a new constitutional amendment, giving states power to make laws relating to generation, transmission and distribution of electricity within their territory. It would be more feasible if states aligned their electricity laws with the plans laid out in the ETP.
- In order to reach the high end of the expectations of the document, it is important that all forms of investments are encouraged. Financial, technology and knowledge transfer as well as human capacity should be greatly considered. Working incentives on importation of components, technological transfer by proposed foreign companies and technical training to help establish a value chain in Nigeria would go a long way in a net zero plan.
- The initial investment of installing an off grid technology can be very expensive. More active loan and credit facilities through commercial banks for solar technologies need to be established. This would encourage more individuals explore solar technology with flexible payment plans.

Ultimately, it is the responsibility of the legislative arm of government to enact laws and policies to create an enabling environment for the investment and proper implementation needed to reach the net zero and energy access goal in the power sector.