



---

## 2050 Long-Term Vision for Nigeria (LTV-2050)

---

*-Towards the Development of Nigeria's Long-Term Low Emissions Development Strategy (LT-LEDS)*

By

**Department of Climate Change,  
Federal Ministry of Environment, Nigeria**

NOVEMBER 2021

## TABLE OF CONTENTS

PREAMBLE.....	II
EXECUTIVE SUMMARY.....	II
<b>1. INTRODUCTION.....</b>	<b>1</b>
1.1 BACKGROUND.....	1
1.2 ESTABLISHING NIGERIA’S LONG-TERM VISION.....	4
1.3 PROCESS FOR THE DEVELOPMENT OF THIS VISION.....	5
<b>2. OVERVIEW OF NIGERIA’S POLICY-RELATED RESPONSE TO CLIMATE CHANGE.....</b>	<b>7</b>
2.1 NATIONAL CONTEXT.....	7
2.2 ADDRESSING THE CLIMATE CHANGE CHALLENGE: MITIGATION AND ADAPTATION MEASURES.....	9
2.3 NIGERIA’S NDC.....	11
2.4 ACHIEVING SUSTAINABLE DEVELOPMENT GOALS IN THE FACE OF CLIMATE CHANGE.....	11
<b>3. NIGERIA’S 2050 VISION.....</b>	<b>13</b>
3.1 CURRENT SITUATION.....	13
3.2 DEVELOPING THE LTV VISION.....	14
3.2.1 <i>Guiding Principles</i> .....	14
3.2.2 <i>Stakeholders’ Consultation</i> .....	16
3.2.3 <i>Main Elements of the Vision</i> .....	17
3.3 THE VISION: WHERE WE WANT TO BE IN 2050.....	18
<b>4. VISIONS BY SECTOR.....</b>	<b>19</b>
4.1 AGRICULTURE, FOREST, AND OTHER LAND USE (AFOLU).....	19
4.2 ENERGY.....	20
4.3 FRESH WATER AND COASTAL WETLANDS.....	22
4.4 INDUSTRY.....	23
4.5 URBAN SETTLEMENTS.....	24
4.6 OIL AND GAS.....	26
4.7 TRANSPORT.....	27
4.8 WASTE.....	28
4.9 CROSS-CUTTING: GENDER INCLUSION.....	29
<b>5. ROLE OF INNOVATION.....</b>	<b>31</b>
5.1 SOCIAL INNOVATION.....	31
5.2 ECONOMIC INNOVATION.....	31
5.3 TECHNOLOGICAL INNOVATION.....	31
5.4 ENVIRONMENTAL INNOVATION.....	31
<b>6. WAY FORWARD AND ELABORATION OF THE LT-LEDS.....</b>	<b>33</b>
<b>ANNEX 1: CRITICAL QUESTIONS/SUBJECTS FOR LT-LEDS ELABORATION.....</b>	<b>35</b>
<b>ANNEX 2: SUGGESTED PROCESS(ES) FOR INCLUSIVENESS AND ROBUSTNESS FOR THE LT-LEDS ELABORATION FOR NIGERIA.....</b>	<b>37</b>

## Preamble

At COP26 in Glasgow, Nigerian President Muhammadu Buhari announced that Nigeria will cut its carbon emissions and reach net-zero by 2060. The President subsequently signed into law a new climate bill that create five-year emission budgets, with a view to achieving net-zero greenhouse gas emissions between 2050 and 2070.

This Long-Term Vision, intended as a first contribution towards the invitation in Article 4.19 of the Paris Agreement to communicate long-term low greenhouse gas emissions development strategies (LT-LEDS), was elaborated in 2020-2021, to collect a broad set of views and prepare for the construction of a full long-term strategy to explore how Nigeria can achieve its new climate ambition.

## Executive Summary

Nigeria, as one of the signatories to the Paris Agreement (PA), recognises that the transition to low-emission development is indispensable for achieving sustainable economic growth through pathways that yield reduced greenhouse gas (GHG) emissions and other social, economic, and environmental benefits.

In addition to the Nationally Determined Contributions (NDCs) that outline climate actions until 2030, the Paris Agreement, under Article 4.19, calls for all Parties to strive to formulate and communicate LT-LEDS, considering common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

To this end, the Federal Government of Nigeria decided to develop its LT-LEDS as part of her onus to ensure a low-carbon future, with an initial focus on a Long-Term Vision to 2050 for the country. The vision provides a clear sense of direction to all stakeholders for a well-managed transition to a low-carbon economy that grows existing and new sectors, creating new jobs and economic opportunities for the nation.

The vision states that: ***By 2050, Nigeria is a country of low-carbon, climate-resilient, high-growth circular economy that reduces its current level of emissions by 50%, moving towards having net-zero emissions across all sectors of its development in a gender-responsive manner.***

It is hoped that this vision will promote sustainable development and guarantee a climate-proofed economic development through multi-stakeholder engagement, especially as Nigeria is also engaged in developing Medium-Term (2021-2025) and Long-Term (Agenda 2050) national development plans. It is also expected to lay a solid foundation for Nigeria to contribute to the global objective of climate neutrality, and to be a climate-resilient society with a knowledge-driven economy that is globally competitive and compliant with Africa's Agenda 2063, as well as enable the country to play its leadership role in Africa effectively.

The Federal Government of Nigeria will now build on this initial long-term vision to develop a full long-term strategy.

# 1. Introduction

## 1.1 Background

Nigeria faces many challenges in her effort to advance its socio-economic and environmental development. A particular challenge is climate change that continues to portend serious threat to the achievement of sustainable development goals (SDGs) in the country. This is because Nigeria is strongly predisposed to severe negative impacts of climate change due to its fragile economy, weak resilience, and low adaptive capacity, as much of the economy is dependent on climate-sensitive ecosystems and natural resources. For example, the agriculture sector, which contributes about 24% to the country's GDP and largely rain-fed, is highly vulnerable to climate change-induced frequent and severe extreme events, such as floods and droughts. Other sectors of the economy are also vulnerable.

The 2017 Climate Change Vulnerability Index (CCVI) published by the UK-based risk company, Verisk Maplesoft, classifies Nigeria as a region of high risk, and indicated that the country is one of the topmost vulnerable countries in the world. If no adaptation is implemented, DFID (2009)<sup>1</sup> estimated that between 2-11% of Nigeria's GDP could potentially be lost by 2020, thereby hampering the national development goal of becoming one of the top 20 economies in the world. Worse still, the same study indicated that climate change could result in a loss in GDP of between 6% and 30% by 2050, worth an estimated US\$ 100 to 460 billion dollars. Kompas et al (2018) further indicated that, with a 3o C rise in global temperature, Nigeria will, in the long-term (beyond 2067), experience up to 16% reduction in its GDP<sup>2</sup>. Climate projections for the coming decades also reveal a significant increase in temperature over cities across all the ecological zones<sup>3</sup>. Overcoming the development challenge of climate change requires that extensive adaptation and mitigation measures that are necessary to reduce vulnerability to future climate change are put in place (FGoN, 2017)). Addressing the challenge climate change poses to national development in a sustainable manner requires that Nigeria moves its economy into a more environment-friendly, climate resilient, green, and sustainable path.

As a result of its relatively low economic development, Nigeria's GHG emissions remain relatively low. The total GHG emission in 2018 from various sectors (agriculture, electricity, forestry, industry, oil and gas, transport, waste etc) was 336 million tons of CO<sub>2</sub>-equivalent (Figure 1)<sup>4</sup>. With this level of emission, Nigeria compares favourably with South Africa in terms of emitting less than 1% of global emissions, However, as its economy is expected to grow rapidly by at least 7% per annum, particularly in the post COVID-19 period, to meet the demands of its large population that is projected to increase to about 402 million by 2050, Nigeria is expected to emit more GHGs in the very near future. This calls for a more ambitious future mitigation efforts in keeping with the country's international climate commitments and with massively increasing adaptation finance to contribute to the global efforts to achieve a net zero emission by 2050.

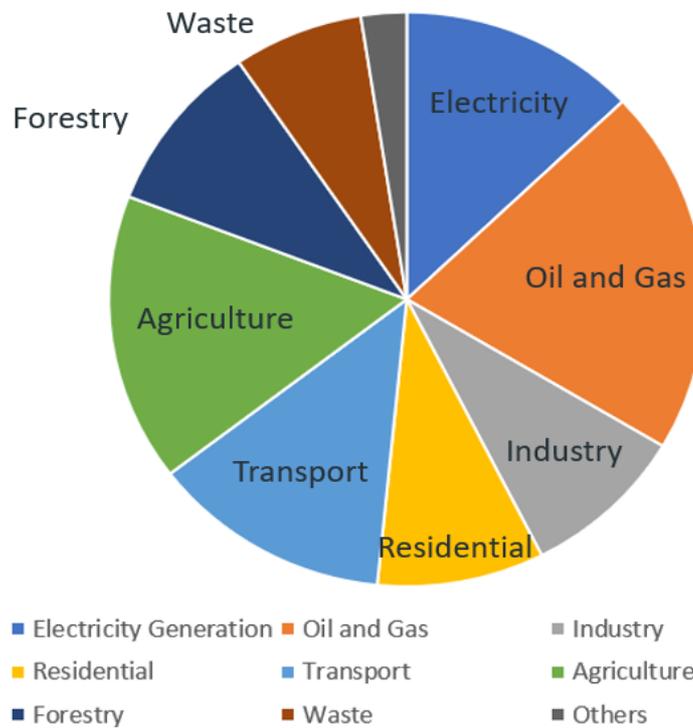
---

<sup>1</sup> DFID (2009) DFID (Department for International Development), 2009: Impact of Climate Change on Nigeria's Economy

<sup>2</sup>Kompas, T., Ha, P.V. and Che, T. N. (2018): The Effects of Climate Change on GDP by Country and the Global Economic Gains from Complying with the Paris Climate Accord. *Earth's Future*, 6, 1153–1173. <https://doi.org/10.1029/2018EF000922>

<sup>3</sup>Akande, A., Costa, A.C., Mateu, J. and Henriques, R (2017): Geospatial Analysis of Extreme Weather Events in Nigeria (1985–2015) Using Self-Organizing Maps. *Advances in Meteorology* <https://doi.org/10.1155/2017/8576150>

<sup>4</sup> NDC update- Mitigation scenario: Modelling assumptions and results ED14074| Issue Number1| Date 29/03/2021



**Figure 1. Major GHG Emitting Sources in the Economy of Nigeria**

Nigeria’s relationship with climate change is further complicated by the fact that the nation’s mono economy is almost entirely dependent on oil mining and export which does not only make it hard to decouple emissions from economic growth trajectory but also leaves Nigeria in a highly unstable and vulnerable fiscal and macroeconomic condition with high fluctuations in global oil price linked to global transition to the green economy and other factors driving energy demand.

However, global trends suggest that ambitious transitions towards low emissions development will further skew the energy outlook with devastating impacts on Nigeria’s economy if there are no sustainable low carbon implementation plans for alternative growth. Thus, addressing the challenge that climate change poses to national development remains one of the most important and fundamental requirements for long term economic planning effectiveness in Nigeria. Long Term Low-Emissions Development Strategy (LT-LEDS) or Long-Term Strategies (LTS) have emerged as a veritable tool and approach with which countries explore the GHG emissions implications of their development aspirations as options for that can help to decouple economic growth from emissions to bridge sustainable development and climate goals.

The imperative for transition to low-emission development is a global phenomenon and has been recognized internationally (especially by United Nations) as a veritable way to stabilizing GHG concentrations with the attendant consequence of significantly mitigating the impact of climate change. The Copenhagen Accord (2009) –Paragraph 2, states that: “*A low emission development strategy is indispensable for sustainable development*”. In a similar vein, the Paris Agreement (2015) –Article 4, Paragraph 19 states that: “*All Parties should strive to formulate and*

*communicate long-term low greenhouse gas emission development strategies, mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.”*

The Paris Agreement of 2015, to which Nigeria is a Party, was a key turning point in the global drive towards transition to low-emission development. It recognized the long-term vision of a transition to low-emission development strategies (LT-LEDS) as indispensable for achieving sustainable economic growth through pathways that yield reduced GHG emissions and other social, economic, and environmental benefits. The Paris Agreement, and subsequently the IPCC Special Report of 2018<sup>5</sup> are clear that LTS will play important roles towards the collective goal to hold the increase in global average temperature to well below 2°C and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, which will require global efforts to peak GHG emissions as soon as possible and followed by multiple action for rapid reduction to achieve a balance between anthropogenic emissions and removals by sinks in the second half of the century.

An LTS is an urgent requirement for Nigeria as it offers the country with binary benefits of tool and process for renaissance in its vision of national development approach and articulate a longitudinal vision for a climate-resilience and climate consciousness that are compatible with tangible development. It goes without saying that to stand a chance of meeting her medium to long term climate objectives including the attainment of zero-emissions target of world record by 2050, a clear and efficient set of measures, will need to be adopted and implemented. To this end, Nigeria, with the support from the 2050 Pathways Platform and anchored at the Department of Climate Change (DCC) of the Federal Ministry of Environment (Annex1) adopted this visioning approach to the development of its LT-LEDS. This is seen as critical to generating a long-term pathway that reflects a variety of social and economic development objectives and diverse stakeholders’ interests to pave the way for robust policy choices zones<sup>6</sup>.

The rationale for Nigeria’s decision to undertake a visioning approach, which is the initial and first step in an LT-LEDS development process is based on the recognition of the peculiar local threats posed by climate change to the economic development aspirations of the country. Nigeria is aware that its heavy dependence on fossil fuel makes the country especially vulnerable in a world that has a target to reduce or even eliminate fossil fuel as a key driver of the global economy. Several her trading partners, such as China, European Union, India, Japan, and the United States have decided to go ‘net zero’ and a number of these countries are already setting bans on the sale of oil-consuming Internal Combustion Engine vehicles. The risk for future oil markets is averred and not theoretical. At the same time, Nigeria is also aware that not responding to a long-term view and acting urgently to increase its resilience to climate impact will compromise its ambition to economic prosperity.

Moreover, as a Party to the Paris Agreement, Nigeria’s LT-LEDS is also in response to the Paris Agreement’s Article 4.19, which calls on Parties to elaborate LT-LEDS. Responding to the challenge of climate change through the pursuit of a low carbon development path therefore remains the most viable and feasible option for the sustainable development of Nigeria. The long-

---

<sup>5</sup>IPCC (2018): Global warming of 1.5°C

<sup>6</sup>2050 Pathways: A Handbook, 2017.

term vision provides Nigeria the pathway to discuss the opportunities that might arise in terms of a cleaner, more dynamic, and more sustainable growth model, and the options for the country to implement a less carbon-intensive model of economic development in the face of decreasing global reliance of fossil fuel energy for development practices. Achieving a climate-neutral economy by 2050 will require progressively phasing out or profoundly changing the country's carbon-intensive industries. This will be particularly challenging and will require a well-managed transition through effective visioning.

## **1.2 Establishing Nigeria's Long-Term Vision**

Nigeria signed the Paris Agreement in September 2016 and ratified it in March 2017, and thus committed to reducing its GHG emissions. In its Nationally Determined Contribution (NDC), the country pledged an unconditional 20% reduction on Business as Usual (BAU) emissions by 2030, and a 45% conditional commitment which could be achieved with financial assistance, technology transfer and capacity building. This shows a strong national commitment to be part of the international effort to achieve the long-term temperature goal set by the Paris Agreement of "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels. With the implementation of all the Low Carbon Development (LCD) opportunities, it is expected that in 2035, GHG emissions for the Business as Usual (BaU) scenario will decrease from the BaU level of 967.2 Gg CO<sub>2</sub>-eq (under the different IPCC Sectors are expected to grow from about 609,836.74 Gg CO<sub>2</sub>-eq in 2016) to an LCD level of 797.2 Gg CO<sub>2</sub>-eq<sup>7</sup>.

The Paris Agreement, to which Nigeria is committed, also recommends that all Parties should strive to formulate and communicate LT-LEDS by 2020 as long-term vision/strategy for responding to climate change. Leveraging its NDC, Nigeria is integrating into its national development agenda, a transition to a low-carbon development pathway because of the tremendous benefits it holds for sustainable national development. In the long run, an LT-LEDS is important for Nigeria as it would enable her to:

- i. carve out a national vision for climate-resilient society that will help in the integration and coordination of critical action programmes on economic, environmental, health, and other sectors, as well as turning programmes, strategies, and plans into concrete actions.
- ii. establish a clear trajectory for achieving a low carbon development, the pillars for such a vision and the policies and measures that will help in the actualization of the vision.
- iii. realign its national policy on climate change to meet the overarching goal of the country's LT-LEDS by 2050.
- iv. build on partnerships that for the Economy and Climate, bringing together government, business, and economic leaders to enhance global and national understanding of how climate action can and drive economic, social and development objectives; and
- v. set Nigeria on a low-emission, green growth and climate-resilient development pathway that will not only help the country to meet its international climate commitments with appropriate actions but also establish implementable policies and financing priorities for low emission economic growth and support buy-in and ownership across numerous stakeholders around a shared vision.

---

<sup>7</sup> Third National Communication (TNC) of the Federal Republic of Nigeria

### 1.3 Process for the development of this Vision

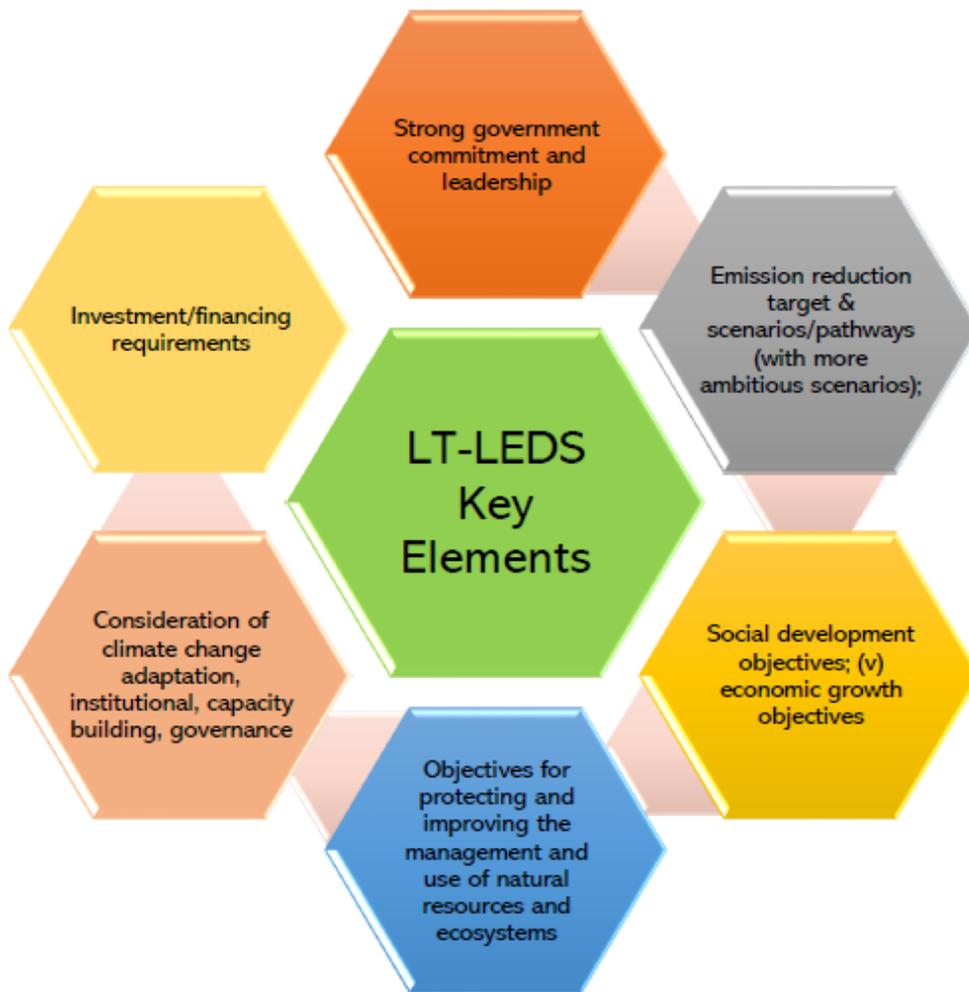
An all-inclusive approach was adopted for the development of the Nigeria's vision of the LT-LEDS. The visioning approach which represented the preparatory phase for the development of the full Strategy, involved:

- Identification and selection of relevant experts that can evolves ideas in tandem with 2050 Low-carbon Vision, comprising experts from MDAs, academia, industry, and civil society organizations on a broad spectrum of options for Nigeria's long-term vision of reducing GHG emissions by 2050 and developing development enhancing adaptation measures.
- Policy survey and analysis of other national policies and strategies with medium to long-term climate targets and aspirations
- Stakeholders' consultation to elucidate responses on what should constitute Nigeria's vision and LT-LEDS to ensure ownership of the LTV for Nigeria.; and
- Drafting and production of the Nigeria's long-term Vision that articulates the national and sectoral Vision to 2050 for the country, as well as of a full workplan/ Terms of Reference for the elaboration of the full LT-LEDS.

This LT-LEDS, of which the LTV development process supported by the 2050 Pathways Platform is a part of, will also build on other ongoing visioning and quantification exercises such as the Nigeria Agenda 2050, as well as the Deep Decarbonisation Pathways Project funded by the French Development Agency (AFD).

The 2050 Pathways Platform is an initiative that was launched in Marrakech at COP22. The objective of the Platform is to support the elaboration of long-term, net zero-greenhouse gas, climate resilient and sustainable development pathways (LT-LEDS). The 2050 Pathways Platform provides a space for collective problem solving through the development of long-term, deep decarbonization strategies, including the sharing of resources (finance, capacity building), knowledge and experiences.

The LT-LEDS include key elements which include: (i) strong government commitment and leadership; (ii) emission reduction target(s) before and in 2050/mid-century; (iii) emission reduction scenarios/pathways (with more ambitious scenarios); (iv) social development objectives; (v) economic growth objectives; (vi) objectives for protecting and improving the management and use of natural resources and ecosystems; (vii) consideration of climate change adaptation, institutional, capacity building, governance; and (viii) investment/financing requirements (Figure 2).



**Figure 1. Key Elements of the LT-LEDS**

## 2. Overview of Nigeria's Policy-Related Response to Climate Change

### 2.1 National Context

Nigeria is located approximately between latitudes 3°15' to 13°30' N and longitudes 2°59' to 15°00' E, sharing boundaries with the Republic of Benin to the west, Niger to the north, Chad to the north-eastern corner and Cameroon to the east, as well as the Atlantic Ocean to the south. It has a land mass of about 923,768 km<sup>2</sup> and is the 14th largest country in Africa. Nigeria's population has grown phenomenally from about 123 million in 2000 to about 189 million in 2016 and remains one of the fastest growing population in the world. With an annual growth rate of 3.2%, the country's population is projected to be about 402 million by 2050 with a high probability of making Nigeria the world's third largest population - behind India and China. The two main features of this growth are the young age structure with more than two-fifths of the population (42.8%) falling below 15 years and the persistently high fertility rate of 5-7 children per woman.

Nigeria's economy is the largest in Africa, although it remains a lower middle-income country, with an income per capita of about \$2,800 in 2015. It has a Gross Domestic Product (GDP) of more than US\$500 billion and witnessed a steady growth annual average of 7.2% between 2005 and 2014. The relatively stable growth was due to strong and stable macroeconomics, supported by the oil sector growth, as well as the inclusion of the previously neglected sectors such as the entertainment industry and ICT in the GDP computation. The GDP growth rate declined dramatically to 2.8 percent in 2015 and -1.6 percent in 2016, showing underlying weaknesses in the macroeconomic fundamentals. Imports to the country are predominantly non-oil goods and services, including among others, food and beverages, primary and processed industrial goods and capital goods.

Economic diversification and strong growth are yet to translate into a significant decline in poverty levels, as over 62% of Nigerians still live-in extreme poverty. Despite its strong fundamentals, oil-rich Nigeria has been seriously challenged by a wide range of binding constraints, including inadequate power supply, lack of infrastructure, delays in the passage of legislative reforms, an inefficient property registration system, restrictive trade policies, an inconsistent regulatory environment, a slow and ineffective judicial system, unreliable dispute resolution mechanisms, insecurity, and perceived pervasive corruption. Persistent finance risks, regulatory constraints and security risks have limited new investment in oil and natural gas, and Nigeria's oil production has contracted every year since 2012. The World Bank Group Flagship Report: *Doing Business 2017* ranked Nigeria 169<sup>th</sup> out of 190 countries in the world in the ease of doing business, 44 places lower than in 2010<sup>8</sup>.

Agriculture is Nigeria's single largest economic sector, and one of the most important areas for development for the country. In 2016, it accounted for 24.4% of GDP, but only 4.8% of the country's total foreign earnings. It employs up to 70% of the labour force<sup>9</sup>.

---

<sup>8</sup> Oladipo (2019) – Policy Note on Climate Change Adaptation and Resilience in Nigeria (submitted to the World Bank

<sup>9</sup>FMARD (2016): Agriculture Promotion Policy -Federal Ministry of Agriculture and Rural Development.

Nigeria is endowed with many renewable and non-renewable energy resources in commercial quantities and some of the best natural forms. The prominent renewable energy resources include sun, wind, hydro, biomass, and tidal wave while crude oil, coal, lignite, tar sands, natural gas, and nuclear elements constitute the major non-renewable energy resources. Despite these huge energy endowments, the very lack of access to affordable and reliable energy services is hindering the industrial production and economic growth of the country. The poverty of energy in Nigeria is such that all manufacturing firms depend on self-generated electricity to power their operations and to maintain power back-up in the event of power failure. Visioning for future sustainable development in a low carbon development scenario requires that energy poverty (being the lack of access to modern energy services) eradication is taken as critical<sup>10</sup>. Sustainable energy for all is essential for the economic growth of Nigeria.

The human health status is a key factor of the development of the country, but Nigeria's performance in this sector remains poor. The life expectancy at birth in 2016 was 54.5 years, an increase of 7.5 years from 2007, but remains below the national target of 70 years by 2015 and the global average of 71 years. The Healthy Life Expectancy of Nigerians was 47.4 years in 2016, which implies 6.8 years of compromised health. Regionally, Nigeria compares poorly - the life expectancy of Ghanaians is 10 years more. According to the 2016 Global Burden of Disease Study, while Nigeria is undergoing an epidemiological transition, communicable diseases still constitute the bulk of disease burden<sup>11</sup>.

The country faces a wide range of environmental challenges. Some of the specific phenomena include Climate Change, which is negatively affecting every sector of the country's economy, particularly agriculture and water resources. Other challenges are deforestation and de-vegetation, causing biodiversity loss and land degradation; floods, drought and desertification which are degrading the environment especially in the semi-arid areas of the country; environmental pollution encompassing air, water, land, and noise; waste generation; mineral excavation and the accompanying environmental degradation as well as limited access to safe water and poor sanitation.

Nigeria is also confronted with a myriad of socio-economic challenges. One of these is inflation, which has remained in double digits for many years. The other prominent challenges are economic recession with its associated growing youth unemployment, high cost of living and corruption, which is creating a clog in the wheels of the nation's development. There are also several social and religious conflicts, prominent among which are the Boko Haram insurgency, Niger Delta militancy, kidnapping, farmers/herders' clashes, agitation for self-determination and ethnicity challenges. All of these have led to colossal loss of lives and properties. They have also generated wider divides, especially along religious and ethnic lines. This situation is unlike what is happening in many other countries such as Canada and the USA where diversity in ethnicity and languages have been exploited to foster strength and unity.

Fighting poverty and insecurity and tackling climate change remain three critical development challenges for Nigeria, as they all impact the utilization of its natural resources. Meeting these

---

<sup>10</sup>Nkoroa, E. Ikue-Johnb, N. and Joshua, G.I (2019): Energy consumption and economic growth in Nigeria: A revisit of the energy-growth debate. *Bussecon Review of Social Sciences* VOL 1 NO 2 ISSN: 2687-2285

<sup>11</sup>FGoN (2018): Second National Strategic Health Development Plan – 2018 - 2022

challenges needs fresh ideas and a radical new way of thinking and doing things. This includes strategic planning and how we maintain, improve, and use our natural resources (renewable and non-renewable) to generate and sustain long-term pro-poor economic growth, thereby reducing poverty and supporting the achievement of the sustainable development goals (SDGs). It also requires that new strategic approaches be put in place to attract significant investment in the country's natural capital (including land, forests, landscapes, water, and fisheries), which is a direct source of income and employment for a large share of Nigeria's people, to make it climate resilient as climate change affects the ability of natural capital to deliver its wide range of products and services. Sustaining and managing natural capital is crucial to the ability of the country to invest in the other types of capital in a sustainable fashion. The situation becomes more critical in many parts of Nigeria where the fragile natural capital is also highly vulnerable to the impact of climate change.

## **2.2 Addressing the Climate Change Challenge: Mitigation and Adaptation Measures**

Nigeria recognizes that one of her main development challenges is to tame climate change from creating a catastrophe for its people and environment. To this end, and in line with global best practices, two sets of measures have often been advocated for confronting climate change. These are *mitigation measures* (such as reductions in emissions of GHG and black soot) to prevent the degree of climate change from becoming unmanageable; and *adaptation measures* (such as building irrigation systems and adjusting agricultural practices) to reduce the harm from climate change that proves unavoidable. While mitigation seeks to limit climate change by reducing the emissions of GHG and by enhancing 'sink' opportunities, adaptation aims to alleviate the adverse impacts through a wide-range of system-specific actions that also improves quality of life.

Nigeria also notes that overcoming the development challenge of climate change requires more extensive adaptation and mitigation measures than currently being applied to reduce vulnerability to future climate change. Future vulnerability will depend not only on the degree of climate change but also on the development "pathway" taken, as well as capacity put in place to cope with the climate change stress. Mitigating GHG emissions and enhancing the adaptive capacity to increase resilience can accelerate the pace of progress towards sustainable development. Adapting to climate change involves reducing exposure and sensitivity and increasing adaptive capacity to build a climate-resilient society. Further to these two broad measures (mitigation and adaptation), Nigeria will also need to promote economic diversification – going beyond lowering the carbon content of activities, but also moving away from oil export dependency.

National mitigation and adaptation measures are guided by the new National Climate Change Policy<sup>12</sup>, which vision is *low-carbon, climate-resilient Nigeria*, and a mission of *ensuring sustainable development and a climate proofed economy through multi-stakeholder engagement*. The goal of the policy is to *promote a low-carbon, climate-resilient and gender-responsive sustainable socio-economic development*, which is expected to (i) reduce Nigeria's vulnerability to climate change impacts, (ii) improve its social, economic, and ecological resilience. (iii) reduce greenhouse gas emissions, (iv) increased awareness of climate change impacts and adaptation and mitigation measures, (v) enhance and strengthen research, innovation and technology development

---

<sup>12</sup> This revised policy to that of 2012 is being processed by the Federal Ministry of Environment (Department of Climate Change) for approval by the Federal Executive Council

and transfer and systematic observations, (vi) enhance capacity to implement climate change related interventions at national, state and community levels, and (vii) mainstream climate change and its cross-cutting issues in national development. A major objective of the goal of Nigeria's Climate Change Policy is the implementation of adaptation and mitigation measures with co-benefits and SDG focused outcomes that promote low-carbon development in the country and reduce the vulnerability of Nigerians to the impacts of climate change.

Within the strategic policy response framework of fostering low-carbon, high growth economic development path and building a climate resilient society to enable Nigeria to meet the challenge of climate change, Nigeria has also identified priority courses of action that will be implemented in its ten-year (2021 – 2030) Climate Change Programme<sup>13</sup>. These activities take into consideration the focused areas of the national policy on climate change and the opportunities offered by international agreements and conventions that Nigeria is party to. Programme focus areas are targeted at (i) managing for resilience in ecosystems, infrastructure and human communities through mitigation and adaptation strategies and initiatives; (ii) addressing current risks, vulnerabilities, policies, capacities, and gaps in knowledge; (iii) facilitating internal and external resources for climate financing; and (iv) engaging internal and external partners in seeking solutions.

In contributing to global efforts to reduce GHG emissions and attaining a low-carbon economy, Nigeria will analyse its options for reducing greenhouse gases, assess various mitigation scenarios and explore various mitigation options that may include increasing the availability of carbon sinks (biological absorption of GHGs) and reducing the level of emissions released into the atmosphere from sectors identified in the Nationally Determined Contribution (NDC) (i.e. agriculture, power, oil and gas, transport, industry, water and waste sectors) which produce the greatest amounts of emissions in the country. The strategies will lay emphasis on (i) reducing GHG emissions, (ii) preventing new GHG emissions to be released in the atmosphere and (iii) preserving and enhancing sinks and reservoirs of GHGs (e.g., by protecting natural carbon sinks like forests or creating new sinks - carbon sequestration).

Since climate change is now inevitable, putting strategies and measures in place to adapt to these changes also remains significant. The country's approach is to **treat adaptation to climate change as an issue of climate-resilient development**, rather than as a bespoke set of activities (flood defenses, drought plans, and so on), combining climate and development challenges into a single strategy. The aim is to protect the health of the ecosystems and the people, human settlements and infrastructure, as well as energy supply among others from climate-related damages and to maximise the benefits from climate-related opportunities. This will prepare Nigeria for a climate-resilient future. The challenge for the country then is how to rapidly develop the economy and fulfill its obligation to the global climate change agreement as elaborated in its NDC.

---

<sup>13</sup> The National Climate Change Programme (2021 – 2030) is also being processed by the Federal Ministry of Environment (Department of Climate Change) for approval by the Federal Executive Council

### **2.3 Nigeria's NDC**

Nigeria recently updated and submitted the [Nationally Determined Contributions \(NDCs\)](#) to the United Nations Climate Change Framework Convention on Climate Change (UNFCCC) as part of her commitment to the global target of keeping the earth's warming below 2°C in line with Article 4.2 of the Paris Agreement.

In the updated NDC, Nigeria recommits to its unconditional contribution of 20% below business-as-usual by 2030 and increases its conditional contribution from 45% to 47% below business-as-usual by 2030, provided that sufficient international support is forthcoming. In addition to the existing sectors of the 2015 NDC, Nigeria in scaling up her ambitious targets, included the waste and water resources sectors and articulates other nature-based solutions not included in the 2015 NDC.

An investment of 177 billion USD is indicated in the NDC for implementation that covers 2021-2030. This value is economy-wide productive investments that is not expected to be a burden exclusively on the government budget.

For more information on the NDC that has been submitted, kindly click on [NIGERIA 2021 NDC-FINAL as submitted 30 Jul 2021.pdf](#)

### **2.4 Achieving Sustainable Development Goals in the Face of Climate Change**

Promoting conservation and sustainable use and management of natural resources to reduce the risks associated with climate extremes as well as resilience building are critical elements for the attainment of many of the sustainable development goals (SDGs) and Agenda 2030. Extremes weather events, such a floods, storm surges, and heat waves can strain cities, roads, drainage systems, power plants, ports, and other types of infrastructure. Also, climate change further threatens the national ability to build and sustain its human capital, particularly through health and education. The concern is that climate change could threaten or reverse Nigeria's advances towards the attainment of the SDGs and overall national development. Thus, all effort should be geared towards ensuring the resilience of the ecosystem through mitigation and adaptation measures.

The NDC sectoral plans identifies strategies to promote economic and social development in a way that sustainably grows Nigeria's economy at 5% per year while making the country more resilient to climate impacts. If implemented, the NDC will improve standards of living, promote clean energy access and food and water security for all, whilst reducing emissions under the 20-45% below business as usual by 2030.

Implementation of the NDC will serve as a catalyst for a comprehensive national climate action and offers Nigeria several opportunities to advance the attainment of sustainable development goals in the country. They include: (i) inducing long-term changes in key economic drivers and sectors, such as power, oil and gas, industry, transport and agriculture and forests; (ii) improving national scope to drive climate change actions at the local level; (iii) keeping up political momentum at the national level and strengthening climate change legislation; (iv) embedding a longer-term vision for low-emission climate resilient development for social and economic

development as well as poverty eradication; (v) mobilizing finance for climate change from diverse sources and creating an enabling environment for private sector investment in climate mitigation and adaptation; (vi) providing innovative measures and mechanisms for the integration of climate change into development planning and strategies at all levels of governance in the country; (vii) presenting a common force to strengthen national adaptation efforts; (viii) warehousing climate policy coordination in a cross-cutting body that is better able to influence policy in major sectors of the economy; and (ix) engaging with government departments, companies and stakeholders in sectors that need to transition into a low-emission resilient development pathway and help mainstreaming climate action into sectoral policies and investments, among others. This approach supports national efforts on the attainment of SDGs, and all that Nigeria now needs is a further development of the political framework and existing institutions to strategically plan and implement the necessary climate change and adaptation measures within a well-formulated long-term vision of development.

## 3. Nigeria's 2050 Vision

### 3.1 Current Situation

Nigeria is a nation of vision. The Vision 20:2020 was the major national development strategy directing the development process in Nigeria in the last decade and during the development of the NDC. This Federal Government's economic growth plan recognises climate change as a threat to sustainable growth in the coming decades. It perceives climate change as a potential driver of "damaging and irrecoverable effects on infrastructure, food production and water supplies, in addition to precipitating natural resource conflict". This Vision is currently being updated to reflect the country's vision of development for 2030. There is also an ongoing initiative to develop an Agenda 2050<sup>14</sup> aimed at making Nigeria a socio-economically advanced nation with a technologically enabled, digitally connected, diversified and inclusive sustainable economy. This 2050 Development Agenda for the country is seen to advocate for the adoption of global best practices to development in Nigeria. It is anticipated to obviously include a visionary approach to address the challenge of future climate change scenarios within the national framework of contributing to the global agreement of limiting global warming-induced temperature increase of 1.5°C above pre-industrial level. The 2020 Economic Sustainability Plan envisioned a resilient and sustainable development in post-COVID-19 Nigeria, which also includes climate resilience.

In addition, many of the national policies contain elements of visioning for low carbon development. The vision of its current Policy on Climate Change is a low-carbon, climate-resilient Nigeria, while that of its NDC is climate-smart development with emphasis on (i) climate-smart approach to ensure GHG efficiency and minimize GHG emissions in its agriculture sector; (ii) promoting climate-resilient industrial development and adoption of green technology in its industrial sector; (iii) transitioning from fossil fuels and reducing gas flaring and fugitive methane emissions through incentivizing the productive use of the gas in its oil and gas sector; (iv) sustainable energy for all (SE4All) by 2030 in its power sector; and (v) fast, safe, efficient, affordable, integrated and inter-modal transport system for goods and people to drastically reduce GHG emissions in the transport sector. Also, improved energy access for all towards a low-carbon economic development is the focus of the country's Energy Policy, with a focus on clean renewable energy development in its Rural Electrification Strategy. In a similar vein, reduction of the nation's dependence on fossil fuel and securing long-term energy security is the main visionary goal of Nigeria's Gas Policy.

The Long-Term Vision for Nigeria (LTV-2050) which is the preparatory step towards the Development of its Long-Term Low Emissions Development Strategy (LT-LEDS) leverages these existing or past visions.

---

<sup>14</sup> Under preparation led by the Federal Ministry of Finance, Budget, and National Planning

## 3.2 Developing the LTV Vision

The process for the development of the LTV Vision for Nigeria involves the adoption of a number of guiding principles and stakeholders' consultations to identify the main elements of the vision.

### 3.2.1 Guiding Principles

This vision will be guided by the following principles that have been highlighted in the National Climate Change Policy:

- ***Country-driven and country-specific climate change interventions and responses.*** Nigeria will think globally but act locally. As a party to the Paris Agreement, Nigeria, through a country-driven effort, will contribute to the global efforts to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels. While doing so, Nigeria will partner with other countries in taking robust climate action through knowledge and technology transfer. Such national efforts will lead to reduce GHG emissions and provide an opportunity for sustainable growth and development.
- ***Build sustainable and resilient economy and social development with adequate adaptation response.*** For development planning processes, facilitate resilience and adaptation to climate change integration in a coherent manner within all relevant sectors and at different levels and with the Sustainable Development Goals (SDGs). Low carbon development compels a rethink of actions to embed new climate economic approaches and alignments with high growth sectors.
- ***Effective citizenship participation.*** This will be key to creating a sustainable environment for industrial development and fostering future growth. The government will provide enabling environment for MDAs at all levels, private sector, civil society organizations, communities, and donor agencies to optimize the use of energy and transit towards a carbon-neutral society.
- ***Shared vision social inclusion, and responsibility among stakeholders.*** The transformation of Nigeria towards a low carbon, climate resilient society will take place within a broad consensus among various stakeholders, including policymakers, private sector, civil society, academia, and local communities. The 2050 vision for Nigeria will be based on public support and engagement, and social inclusion.
- ***Identification of low-carbon transition enabling activities.*** In Europe, Gas, and nuclear energy, are examples of *transitional activities* in full respect of “do no significant harm” as they are seen as allowing economic activities to be labelled as environmentally sustainable<sup>15</sup>. In Nigeria, “Natural gas is accepted more or less as a transition fuel, the

---

<sup>15</sup><https://www.europarl.europa.eu/news/en/press-room>

bridge to renewable energy.”<sup>16</sup>. Thus, whether Nigeria economy could leverage activities in gas sector as transition to a low-carbon economy with “no significant harm remains a conjecture.”

- **Promotion of environmental quality and ecological equilibrium.** Environmental quality and ecological equilibrium will be promoted by moving away from linear economy (fossil-fuel based production, distribution, and consumption patterns) to circular economy that will ultimately enable people to achieve universal goals for environment and health. Nature-based solutions will be continuously pursued to accelerate the transition to a low carbon society whilst ensuring growth and the economic and social wellbeing of the people.
- **Transparency, accountability, and equity.** Nigeria will ensure transparency, accountability, and equity as it moves towards achieving its mid-century vision. The Government will inform the people of the detailed costs to be incurred from this transition as well as the benefits of climate action in a transparent manner, as well as ensuring that the costs of implementation are borne in a fair and equitable manner by all members of the Nigerian society.
- **Monitoring, evaluation and reporting of all climate change interventions and lessons.** Government will put in place a robust national monitoring, reporting and verification (MRV) system to monitor, evaluate and report on each stage of the transition. It will also regularly share information with the people on gains and losses of the transition and seek their consent on the way forward based on lessons learnt.
- **International partnership and cooperation.** Climate change is a transnational phenomenon. There are cross cutting challenges at multi-scale with multistage dimensions. Funding adaptations places severe burden on scarce resources creating avenues for maladaptation and adaptation deficit. Meeting urgent climate action of changing world requires bilateral and multilateral cooperation. There is the imperative to ratchet green climate fund to improve international support if Nigeria will surmount near term climate risk as well as promoting a cultural shift needed for the institutionalization of net zero emission economy. Nigeria will need to leverage opportunities for capacity building, efficient energy and innovations in technologies and digital transformations through bilateral and multilateral partnerships and cooperation.
- **Policy Coordination:** The bane of effective climate governance and the green transition is poor policy coordination and inconsistencies. Lack of coordination between ministries and MDAs in climate change mitigation and adaptation creates gaps and results in gross inefficiency. The result of which is that mitigation and ‘greening’ efforts are scattered in different sectoral policies with different institutional mandates foisting policy ownership crises. Policy coordination will ensure multisectoral coordination; improve the delivery of service while also providing the direction for the journey to a carbon just civilization. Policy coordination will reduce the coordination gap between different MDAs in the

---

<sup>16</sup> (VP statement on behalf of President Buhari at Africa Regional Heads of Government Commonwealth Roundtable. <https://insidebusinessafricang.com/2021/04/16/osinbajo-seeks-fair-transition-towards-global-net-zero-emissions-target/>)

adaptation space, reduce overlapping mandates by insisting responsible MDAs are tasked with adaptation and mitigation and enhance effectiveness and accountability which increased local buy-in and legitimacy.

- **Good Governance:** Good governance underpins all the elements of an LTS: A stable environment for the maintenance of the harmonious relationship between humankind and nature hinges on good governance. Governance is the bedrock of economic, political, and environmental sustainability. The nature and form of governance structure determine the level of success achieved in LCD. Good governance is related to equitable climate governance as promoting equity minimizes climate risks, fosters harmony, and builds enduring climate structure conversant with the needs of a changing world yet, is mindful of intra and inter-temporal equity.

### 3.2.2 Stakeholders' Consultation

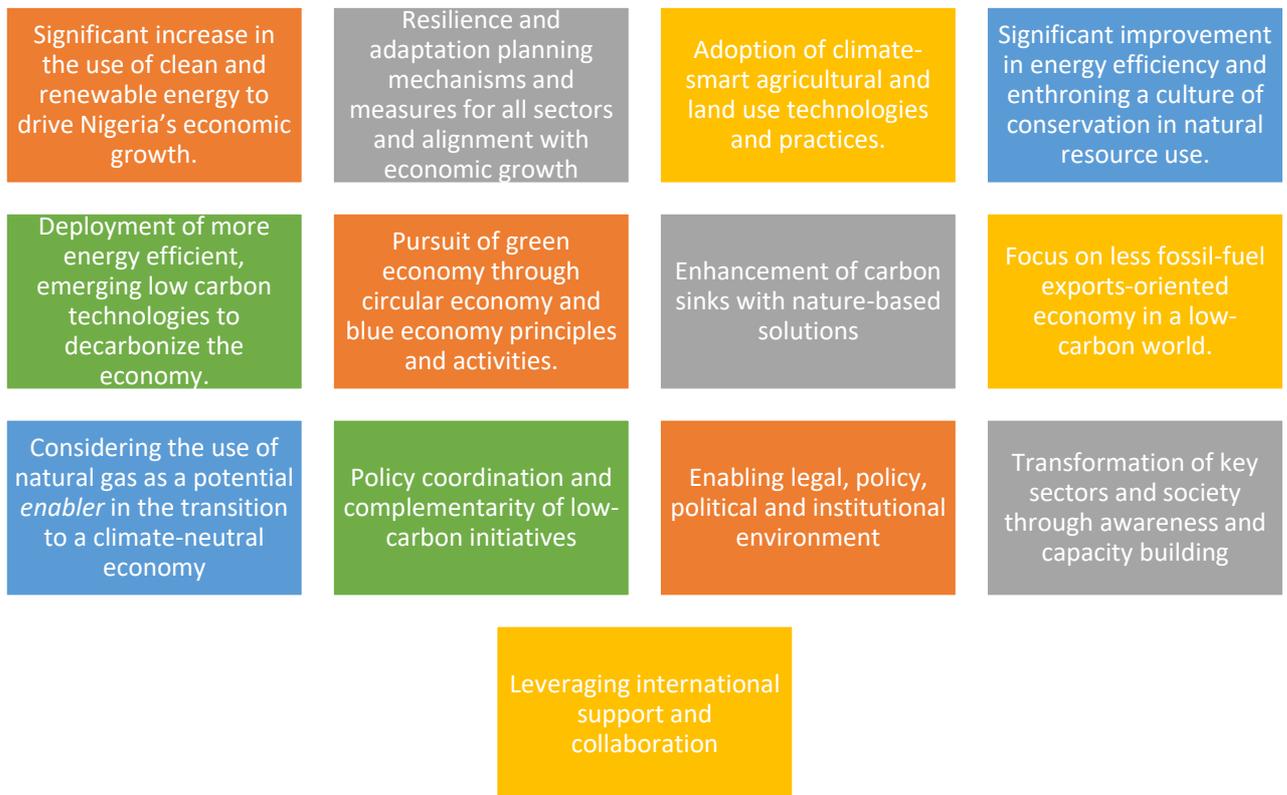
In the process of developing the vision, representatives of Ministries, Departments and Agencies (MDAs) that are either directly or indirectly connected with the planning and implementation of NDC activities for Nigeria were consulted for their visionary views on national development in the face of expected impacts of climate change in the country. This was done through a questionnaire and structured dialogue. The list of stakeholders consulted is given in Annex 2 with a summary of the views of various MDAs that were consulted. They all indicated, in qualitative terms, the country's concern for climate change and the desire to move Nigeria's development in the path that will significantly reduce the country's dependency on fossil fuel, particularly oil, while focusing on increasing its reliance on gas and renewables, such as solar and wind, for sustainable climate-resilient and climate-compatible development. In this way, it may be said that Nigeria will pursue the path of low-carbon development in its immediate and future development plans to enable it to meet its obligations towards international commitment to the Paris Agreement and to align with anticipated global best practices for sustainable development. Modeling scenarios will be developed to depict the trajectory that Nigeria will follow in the course of LT-LEDS development

Private sector needs government enablement to create new investable opportunities that encapsulates visibility, transparency, viability, and bankability. The new climate economic systems are the overarching economic enablers that leverage use of digitalization and to improve efficiency across multiple economic systems such as the circular economy, bioeconomy green, blue and food economies amongst others. The extent to which emerging economies like Nigeria can spur cities to catalyse sustainable, inclusive, and resilient growth is crucial not only for their future, but for the entire world as well. Future sustainable cities would embed industrial parks, agro-allied sectors, new housing, manufacturing and trade and commerce to spin out millions of new opportunities and jobs for decades to come. Under this scenario, energy and economic growth modelling for key economic sectors contributing to low emissions growth with provision to replace fossil fuel economy by 2050 would be needed.

### 3.2.3 Main Elements of the Vision

From the various consultations conducted among various stakeholders, key elements were identified in the vision development as depicted in Figure 3. These are also anticipated to eventually guide the development of the LT-LEDS for Nigeria.

The question is where does Nigeria want to be in 2050?



**Figure 3: Key Elements by the Stakeholders that Guided the Vision Development**

### 3.3 The Vision: Where we want to be in 2050.

Nigeria will continue to be part of the global efforts and collective engagements required to frontally address the challenges of climate change, while aiming at becoming a high middle-income economy. Thus, the LT Vision will be that ***by 2050, Nigeria is a country of low-carbon, climate-resilient, high-growth circular economy that reduces its current level of emission by 50%, moving towards having net-zero emissions across all sectors of its development in a gender-responsive manner.***

It is hoped that this vision will promote sustainable development and guarantee a climate proofed economic development through multi-stakeholder engagement across multiple sectors that include the bioeconomy, blue, green and food economies, especially at this time that Nigeria is also engaged in developing medium-term (2021-2025) and long-term (Agenda 2050) national development plans. It is also expected to lay a solid foundation for Nigeria to contribute to the global goal of climate neutrality, and to be a climate-resilient society with a knowledge-driven economy that is globally competitive and compliant with Africa's Agenda 2063, as well as enable the country to play its leadership role in Africa effectively. In the long-term, Nigeria's Long-Term strategy must align with key principles of these complexly interrelated strategies and visions to enshrine economic growth while also building a climate resilient economy.

#### The Vision

***By 2050, Nigeria is a country of low-carbon, climate-resilient, high-growth circular economy that reduces its current level of emission by 50%, moving towards having net-zero emissions across all sectors of its development in a gender-responsive manner.***

## 4. Visions by Sector

The proposed long-term Vision for Nigeria's LT-LEDS remains largely broad and encompassing many sectoral "visions" that would need to be properly integrated for sustainable national development. The key sectoral "visions" are highlighted in this section of the report.

### 4.1 Agriculture, Forest, and other Land Use (AFOLU)

Agriculture, Forestry, and other Land Uses (AFOLU) is a major sector that has the most significant contribution to climate change in Nigeria and which also impacts on climate change significantly. As agriculture contributes about 24% to the country's GDP, reducing GHG emissions from this sector and adapting the sector to climate change remain critically important for any long-term vision for low carbon development in Nigeria. Destructive land use practices such as deforestation, uncontrolled use of fertilizers and poor livestock management contribute significantly to the release of GHGs, particularly carbon-dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O) and methane (CH<sub>4</sub>). According to Nigeria's Third National Communication submitted to the UNFCCC 2020, total GHG emissions from AFOLU stands at 366,734 Gg CO<sub>2</sub>-eq, representing about 60% of the total net GHG emissions for the country. On the other hand, appropriate land use practices such as agroforestry will increase the carbon sink potentials of the sector. Thus, this sector holds significant climate change mitigation potential for Nigeria through reductions of GHG as well as enhancement of agricultural sequestration and application of climate smart technologies.

The Vision 20:2020 seeks to improve agricultural productivity by enhancing yield per hectare, reducing post-harvest losses, and increasing processing and integration with an industrial value chain to feed the nation's growing population. Reducing GHG emissions from AFOLU offers a great opportunity for Nigeria to contribute to land cover changes at global, national, and local levels that have characterized human-environment relationship. AFOLU also has both local and global benefits to climate change mitigation and whilst supporting millions of smallholder farmers adapt to climate change impact.

The major challenge for the country is to reduce its rate of deforestation, which is one of the highest in the world. With rapid growth in population and its associated demands on forest and non-forest products, the impact of extraction continues to escalate the challenges of deforestation as well as de-vegetation, to the extent that only less than 10% of forest cover remains. Utilizing the country's agricultural resources for food security is also an area of national importance with implications for GHG emissions.

To move the AFOLU sector to a LT-LEDS, Nigeria will develop and/or deploy low-carbon agricultural adaptation technologies and practices, water management in irrigated rice farms, low-methane fodders for livestock, low-input farming; development of soil carbon storage methodologies and management; and replacement of fossil fuel with clean energy sources. The Government will pursue Research and Development on these low-carbon farming practices and expand education and support for farmers for wider application. The Government will also need to scale up certification and labelling of low-carbon agricultural produce, meats or dairy products that are produced using farming practices that minimize inputs, such as chemical fertilizers and

pesticides. In the urban areas, significant effort will be targeted at (i) optimizing the use of city long spaces by diversifying uses, for example agropolis urban farming systems, while promoting urban forms that are resilient to the effects of climate change, and (ii) stopping degradation of agricultural, natural and forest areas and limiting the drying of wetlands.

Government will sensitize consumers to do their part by generating less food waste and changing their dietary habits to reduce their carbon footprints in their daily life. There will be public awareness-raising programmes to change people's consumption patterns and lead them towards a low-carbon lifestyle. Best practices and lessons learnt from farming and fishing communities elsewhere that use solar, wind and other eco-friendly energy sources will be emulated. Such lessons will serve as a model for future lifestyle, balanced national development, and eco-friendly energy transition. They will be exhibited as best practices of combining energy transition with local development. They will also help Nigeria to be prepared for potential social changes, e.g., changing industrial site locations and population migration.

*Increasing resilience to climate change and effectively reducing GHG emissions in the AFOLU sector will be feasible within a vision that states that **by 2050, Nigeria is a country in which sustainable land use and Climate Smart Agriculture (including livestock and fisheries) practices are adopted by all large-scale farmers and more than 75% of smallholder farmers, while forestry management practices are in line with the global mechanism of reducing emissions from deforestation and forest degradation (REDD+).***

## 4.2 Energy

The Third National Communication reported that the total GHG emissions from the energy sector stands at 206,452 Gg CO<sub>2</sub>-eq or about 34% of the total net GHG emissions of Nigeria. As the second major contributor of GHG in Nigeria and given the potential transformational effects for the development of other sectors, the energy sector is critical in the country's effort to reduce GHG emissions and pursue long-term low-carbon development.

Visioning for a low carbon development in Nigeria's energy sector remains a serious challenge, as the country's economic growth is still largely dependent on oil and gas. Nigeria has the second largest proven oil reserves in Africa after those of Libya. It has oil reserves of about 35 billion barrels and gas reserves of about 5.8 trillion m<sup>3</sup>, ranking 10th and 9th in the world, respectively. There is also about 21 million tonnes of proven recoverable bituminous coal reserves, including anthracite.

Nigeria in the foreseeable future will continue to depend on oil and gas for its economic development. It is noted however, the recent past shows that the country faces declining production and, in the future, lower global demand and lower prices. The impact of these and low carbon scenarios on expected oil and gas revenues would be developed to put things in perspective.

The economic importance of oil and gas makes Nigeria, like other oil and gas producing countries of the world economically vulnerable to global efforts to reduce GHG emissions. As global action to reduce GHG emissions will necessarily require reduced consumption of fossil fuels, this will

affect the country's main economic base—the extraction and export of oil and gas<sup>17</sup>. However, while addressing climate change and reducing GHG emissions presents challenges for the country's development, it is also an opportunity that could intensify the national effort to diversify its economy and lead to the development of low-carbon technologies such as carbon capture and storage (CCS), energy efficiency technologies and alternative energy. Moreover, the Vision 2020 singled out the expansion of electric power production from gas and hydropower as a key driver of growth. Associated and non-associated gas will increasingly replace the predominantly diesel-generating sets ubiquitous in companies and homes. As gas prices rise and regulation improves, more of the currently flared natural gas will find its way into power production, thereby reducing GHG emissions from gas flaring<sup>18</sup>. With support from international development partners Nigeria shall seek to use of gas, as opposed to just flaring, with substitutes diesel generators for large installations and renewables would be an alternative. And even in smaller installations.

In addition, Nigeria has renewable and non-renewable energy resources in commercial quantities. The main renewable energy resources include sun, wind, hydro, biomass, and tidal wave. The Third National Communication concluded that solar energy is the most promising renewable energy resource due to Nigeria's location within the heart of the tropical region where sunshine and solar radiation are very abundant and well distributed. The report estimated that the available annual solar energy in Nigeria is about 27 times her total fossil fuel resources and about 115,000 times the electrical power generated in Africa's most populous country and largest economy.

A wide variety of mitigation options can be applied in the energy sector. Renewable energies can make a major contribution to reducing emission levels. Renewable energy and energy efficiency are globally promoted as measures to reduce greenhouse gas (GHG) emission and response to climate change. The country's Renewable Energy Master Plan projects to 2025 of 26.7% renewable energy contribution to the Nigeria's energy use. This was expected to reduce CO<sub>2</sub> and GHG emissions at 38% by 2025. In the same vein the country's NDC energy sectoral plan indicated that increasing the current pace of energy efficiency improvement in all sectors of the nation's economy to 2.5 percent per year, could achieve a 40 percent reduction in the amount of energy consumption by 2030, measured in terms of energy intensities, and thereby contribute significantly to GHG emission reduction in the long run.

The following are needed to move Nigeria in the direction of long-term decarbonisation pathway: (i) promote decarbonization goal through carbon market; (ii) embedding innovative technology to catalyze green growth; (iii) scale-up the use of natural gas rather than PMS and liquid fuels; (iv) scale-up in renewable energy technologies; (v) adopt fiscal incentives to promote renewable energy utilization including subsidies, tax holiday, investments, grants and import exemption to incentivize prospective investors. In the urban areas, focus will be on energy efficiency in both new and existing buildings; design buildings to utilise more natural lighting and consume less energy. Furthermore, there is need for subsidy reform, carbon tax, eco-labelling, carbon market to send long-term policy signals.

---

<sup>17</sup> Qatar and the Gulf Cooperation Council – see Meltzer, J., Hultman, N. and Langley, C (2014): Low-Carbon Energy Transitions in Qatar and the Gulf Cooperation Council Region.

<sup>18</sup> Eleri, E. O., Onuvae, P. and Ugwu, O. (2013): Low-carbon energy development in Nigeria: Challenges and opportunities. IIED

The objective of the country's vision for low-carbon energy is to initiate changes in the energy production patterns to significantly increase the renewable energy proportion of the country's energy mix, as well as promote and enforce improvements in energy distribution systems (e.g., improved power grids) to avoid inefficient use of energy resources, through the adoption of appropriate and new technologies for climate change mitigation. From current realities in Nigeria's energy sector, the 2050 vision for the sector should be anchored to *decarbonize the energy sector by halving emissions in the sector relative to current levels and increasing the contribution of renewables to the country's energy mix by 50% with a view of achieving net zero carbon emission by the end of the century*

### 4.3 Fresh Water and Coastal Wetlands

Nigeria has significant total water resources estimated at 215 billion m<sup>3</sup> of surface water and 87 billion m<sup>3</sup> groundwater resources, although with large-scale spatial inequalities in different regions of the country. Nigeria's coastal and marine environment stretches for about 853 km along the coastline and inland for about 15km in Lagos in the west to about 150km in the Niger Delta and about 25km east of the Niger Delta. However, Nigeria has significant challenges in ensuring proper and sustainable management of its water resources for domestic, agricultural, and industrial purposes.

It is estimated that the annual total water demand in Nigeria is about 5.93 billion m<sup>3</sup>. This is expected to increase to 16.58 billion m<sup>3</sup>/year in 2030. According to an analysis in **Nigeria's Water Master Plan (2014)**<sup>19</sup>, the projected global warming-induced change in air temperature over Nigeria could bring about 20% reduction of annual runoff in the country. Groundwater recharge could also be reduced by up to 20% due to influence of the climate change. Additional 5 to 20m lowering of groundwater for the whole country is predicted by 2030. This would warrant the need to drill boreholes at 20m deeper than current depth and make the depth of pump table to attain 20m deeper than it is currently. Over-pumping may further aggravate the impact of climate change on the lowering of groundwater level and possible ground subsidence effects in the country. This is an interesting example of interactions between water, energy, and climate nexus. Due to more intense climatic changes and higher air temperature, drought will set in, thus leading to higher demand for water. But the lower the groundwater table, the more energy and costs will be needed to build and operate deeper infrastructure systems. Depending on the source of the energy, this might result in higher emissions or other pressures.

Climate change and climatic variability will further threaten the water supply potential of the country as water supplies will be affected, not only for agriculture, but also for industry, energy production and even fisheries, in addition to health impacts and threats to biodiversity. In addition, it is also important to note that other activities being planned by Nigeria to reduce emissions or build resilience may be limited by water or influence available and usable water resources. Industry, energy, and agriculture in the same basin or dependent on the same water resource may compete for the resource<sup>20</sup>. This compels the need to manage water and climate change in a more

---

<sup>19</sup>FMWR (2014): Revised Nigerian Water Resources Master Plan. Joint Japan International Cooperation Agency, Japan (JICA)

<sup>20</sup>FMWR (2014): Revised Nigerian Water Resources Master Plan. Joint Japan International Cooperation Agency, Japan

holistic and coordinated manner imperative. It also informs that the water sector must be part of the global effort of limiting global temperature increase to well below 2°C by 2030 as captured in the Paris Agreement, and for the NDC is the national implementation policy.

The provision of drinking water and the treatment of wastewater require tremendous amounts of energy, the production of which is responsible for high amounts of CO<sub>2</sub>-emissions. For example, a crude estimate indicates that the supply of 5.93 billion m<sup>3</sup> that was estimated as water demand (which may also include pumped irrigation water) in 2013 by the WRMP would have resulted in the emission of about 4MtCO<sub>2</sub>. Thus, it can be affirmed with some degree of certainty that if water supply in the country is fully sourced through renewable energy powered sources, then it would be possible to achieve good targets for emissions reduction for the sector in the NDC implementation. Emissions from domestic wastewater in 2016 was estimated to be 1.95MtCO<sub>2</sub>-eq. Thus, the inclusion of the water sector in the NDC is evidence of increasing recognition of its high potential to reduce energy demand and thus contribute to the overall goal of climate change mitigation.

The processes of water extraction, reticulation and treatment offer various mitigation options to reduce carbon emissions. The main challenge is to keep the impacts of climate change from becoming a disaster to the water sector and water resources more generally. For example, the indirect impacts of biogeochemical cycle in dams and drops in hydrostatic pressure during water level drawdowns can influence ebullition, which ultimately, will decrease CH<sub>4</sub> that is further oxidized to CO<sub>2</sub> by methane oxidizing microbes. The saga of burning river tributaries in Nigeria's Niger Delta region due to incidental oil spills is a grim reminder of water share of emissions impacts. Also, the ill managed industrial waste disposal triggered carbon pollution in rivers of USA (Cuyahoga-Cleveland 1969, Chicago 1970, Buffalo 1970, and Rouge 1971). These incidents clearly point to emissions warning symbols to humanity on impacts of inadvertent water management neglect. Similarly, the role of catchment activities in fueling microbial methane (Kiene, 1991) and organic matter decomposition (Thorton, 1991) was also reported. In Nigeria, the greatest impacts stem from industrial clusters, where steam boilers are used at supercritical temperatures for either heating, or processing of consumer goods. The wharfs, seaports and marinas also contribute significantly to local GHG emissions because of shippers' obduracy to IMO green flag directives.

*The country's vision for the water sector is to Nigeria minimizes the impact of climate change on the sector, improves energy efficiency and increases sector's resilience for sustainable water development, through strategic mitigation and adaptation options.*

#### 4.4 Industry

Nigeria's industrial sector in 2019 contributed about 27% of the nation's GDP<sup>21</sup>, despite the challenges of inadequate power and infrastructure, quality issues and limited access to finance, as well as high cost of energy. Insufficient power generation capacity is driving companies to use

---

<sup>21</sup> Nigeria: Distribution of gross domestic product (GDP) across economic sectors from 2009 to 2019 downloaded from [https://www.statista.com/statistics/382311/nigeria-gdp-distribution-across-economic-sectors/#:~:text=Distribution%20of%20gross%20domestic%20product%20\(GDP\)%20across%20economic%20sectors%20Nigeria%202019&text=In%202019%2C%20agriculture%20contributed%20around,percent%20from%20the%20services%20sector.](https://www.statista.com/statistics/382311/nigeria-gdp-distribution-across-economic-sectors/#:~:text=Distribution%20of%20gross%20domestic%20product%20(GDP)%20across%20economic%20sectors%20Nigeria%202019&text=In%202019%2C%20agriculture%20contributed%20around,percent%20from%20the%20services%20sector.)

natural gas and diesel to self-generate power. Thus, while their growth and success help to reduce the level of unemployment in the country, their rapidly increasing rate of GHG emissions remains a source of concern<sup>22</sup>.

The country's comprehensive industrial policy is set out in the Nigeria Industrial Revolution Plan (2014), and it indicates that Nigeria intends to fast-track the renaissance of the country's manufacturing industries as a key source of growth, jobs, and food security. With the current use of natural gas and diesel to generate power, increasing the industrial output of the country may lead to increasing rate of GHG emissions. The NDC sectoral analysis for industry indicates that the sector's GHG emissions could increase from 4.2 Mt CO<sub>2</sub>e in 2010 to 14.8 Mt CO<sub>2</sub>e in 2030 if no measures to improve energy efficiency are implemented<sup>23</sup>. Thus, government recognizes that as the sector grows there must be a coordinated shift to low emission production systems. The use of green technology to ensure sustainable efficiency of the development of factory facilities to the fabrication and installation of production equipment will reduce the demand for fossil fuels and enhance overall efficiency.

Specific industrial energy efficiency plans that will be implemented with the overall objective of reducing GHG emissions in the industrial sector include the National Renewable Energy and Energy Efficiency Policy (NREEEP) (2015), the National Energy Efficiency Action Plan (NEEAP) (2016), and the Sustainable Energy for All (SE4ALL) Action Agenda (2016). In particular, the NEEAP sets out several measures that work towards achieving the SE4ALL proposed targets for industrial energy efficiency. In the NDC analysis, these targets were to improve on 2015 energy consumption levels by 20% by 2020 and by 50% by 2030 through energy efficiency<sup>24</sup>.

Nigeria's current focus is the use of natural gas to generate power and increase the industrial output of the country, while minimizing increase in GHG emissions to comply with its global obligation of low-carbon development. To effectively achieve this goal, the country will need to be well positioned to pursue an alternative and sustainable path to industrialisation that takes advantage of new innovations, technologies, and business models.

The national vision for the industry sector is that by 2050 *Nigeria will have a low carbon industrial sector with enhanced energy efficiency that seizes the opportunities that comes with global transition towards climate resilience and circular economy.*

This vision will accelerate the country's industrial development, utilizing energy mix with an emphasis on renewable energy and promoting energy efficiency networks for industrial enterprises.

#### 4.5 Urban Settlements

A large share of global GHG emissions is attributable to cities. The International Energy Agency (IEA) estimates that urban areas currently account for more than 71% of energy-related global

---

<sup>22</sup>Eleri, E. O., Onuvae, P. and Ugwu, O. (2013): Low-carbon energy development in Nigeria: Challenges and opportunities. IIED

<sup>23</sup> FGoN (2017): NDC implementation action plan for the industry sector

<sup>24</sup> ibid

GHG and this is expected to rise to 76% by 2030, making energy-related emissions the largest single source of GHG<sup>25</sup>. In 2019, 51.16% of Nigeria's total population lived in urban areas and cities. The eight largest cities in Nigeria will become even bigger by 2030. The population growth of Nigeria's biggest city Lagos will almost double within the next decade to about 20 million people. Three other cities will also almost double their population and in the context of the global trends, Nigerian cities, where most production activities are taking place, will in the future become a major source of GHG emissions from a production-based perspective if emissions are allocated to the places where they are generated. Nigerian cities will, therefore, play a major role in the country's climate change mitigation efforts. Their main challenge will be how to combine sustainable growth, development, and an enhanced quality of life whilst lowering CO<sub>2</sub>- emissions.

Effective management of Nigerian urban centre offers the potential to capitalize on the multi-layer benefits of mitigation, adaptation, and improved access to services. Cities with excellent services are resilient cities: advanced drainage systems can alleviate flooding during intense storms; robust healthcare services are equipped to respond to emergencies; warning systems and transportation infrastructure allow citizens to evacuate in response to risk. The key requirement is synergy between sectors: electricity; water and wastewater; heating; cooling and transport with investments in energy efficient heating and cooling of buildings and electrified transport. Main strategic approaches may include:

- Promotion of compact urban areas (by curbing urban sprawl) in such a way that reduces the need for building on undeveloped land that can instead serve as carbon sinks.
- Strengthen development control functions to avoid haphazard planning and development and ensure adoption and implementation of national planning laws by states and local government councils.

**The national vision for country's urban sector is for *Nigerian cities reduce their carbon footprint by 50% by 2050 and move towards becoming carbon-neutral and climate-resilient at the end of the century.***

It is worthy to note that Lagos is part of the [Climate Ambition Alliance](#), pledged to Net Zero by 2050.

---

<sup>25</sup>International Energy Agency (IEA) (2008), World Energy Outlook 2008, IEA, Paris

## 4.6 Oil and Gas

Globally, the oil and gas sector are a major source of GHG emissions. According to the International Energy Agency's (IEA) *World Energy Outlook 2018*, indirect GHG emissions from oil and gas operations, including carbon dioxide and methane emissions, make up about 5.2 billion tonnes of carbon-dioxide equivalent, equivalent of about 15% of the world's energy sector's total GHG emissions. The oil and gas sector in Nigeria contributes up to 14% of the country's GDP, and accounts for 95% of the foreign exchange earnings. It also contributes to 65% of the annual federal budget. The country's NDC indicates that the main GHG emissions in the sector are from gas flaring, fugitive methane emissions, on-site fuel use (upstream and midstream) and on-site fuel use from refineries as well as artisanal crude refining that is ubiquitous in the Niger Delta area and contributes to significant environmental degradation due to the use of artisanal equipment in the refining process<sup>26</sup>. The combined contribution of flaring and venting to the environment is about 80% of emissions in the sector. The target is to reduce flaring down to less than 10% by the year 2020 and end it completely by 2030. The strategic approach is to deploy the vast gas resources of the country as the major fuel for power generation and to position Nigeria as the African regional hub for gas-based industries.

Eliminating flaring by 2030 could save around 64 million tonnes of CO<sub>2</sub> per year and have large development co-benefits. This target is achievable if the right legislation and strategies are implemented. The Nigerian Gas Flare Commercialization Programme (NGFCP) (2016), Nigerian Gas Policy (2017), Flare Gas (Prevention of Waste and Pollution) Regulation (2018) and the Petroleum Industry Roadmap as well as the Nigeria Gas Masterplan contain well defined propositions to achieve the target<sup>27</sup>.

Critical policy measures that can be advanced for a carbon neutral oil and gas sector in Nigeria, as indicated in the National Climate Change Policy, will include:

- Pursue green jobs and just transition strategy to attain low-carbon transition for oil and gas sector plus a strategy that anticipate and accommodate stranded assets in the country.
- Supporting low-cost, technically feasible solutions to reduce methane emissions in oil and gas operations, including recovery and use of escaping gas.
- Incentivizing the deployment of natural gas as Nigeria's major transition fuel for power generation, industrialization, and domestic use, particularly cooking, towards ending gas flaring and anticipating what comes after gas in two – three decades.
- Facilitating sustainable regulatory frameworks and incentives, as well as financial mechanisms to end gas flaring by 2030.
- Investment and use of smart technologies in oil refining; and
- Reducing fugitive emissions in the sector

The national vision in the sector will be ***to reduce carbon emission from Nigeria's oil and gas value chains by 50% of its current level by 2050 and transit to net zero emission by the end of the century.***

---

<sup>26</sup><https://www.stakeholderdemocracy.org/wp-content/uploads/2015/04/CommunitiesNotCriminals.pdf>

<sup>27</sup> FME (2020): Climate Change Policy of Nigeria

## 4.7 Transport

The transport sector is the backbone of any productive system; enabling the mobility of people and goods means connecting people and nations and fostering economic and cultural exchanges and social development. It is a major emitter of GHGs in Nigeria, and accounts for nearly one-tenth of total Nigerian emissions (Eleri et al., 2013)<sup>28</sup>. However, by 2016 it accounted for 31.9% of total emissions in Nigeria.<sup>29</sup> Cervigni et al (2013) indicated that between 2010 and 2035 fuel consumption in the sector is projected to increase by 680%, driven by a five-fold increase in total vehicle kilometers driven and induced by greater level of growth observed in the commercial vehicle fleet increasing importance of non-oil products in Nigeria's manufacturing industries, as well as the expansion of the service sector due to rising incomes, and the removal of the gasoline subsidy that makes the use of heavy diesel-fueled vehicles more attractive. GHG emissions are forecast to increase significantly over the same period, driven by increasing population, economic activity, and wealth. The complexity of the transport sector requires deploying a diverse mix of decarbonization solutions to meet the challenges within each of its four main segments: roadways, railways, aviation, and navigation.

Government's response to minimizing GHG emissions in the sector, as elaborated in the transport's sectoral plan for the NDC is a fast, safe, efficient, affordable, integrated, and inter-modal transport system for goods and people. It is targeted at reducing GHG emissions by about 4MtCO<sub>2e</sub> by year by 2030, whereas the projected rise in emissions is projected at over 25times of that value. This obviously is not an adequate target for country that intends to be carbon neutral by 2050. The national transport policy also seeks to expand rail infrastructure, improve road construction and maintenance as well expand urban collective transportation, among other pursuits. These are all important elements in a green transportation strategy that will require the institutionalization of appropriate behavioural and social modifications among Nigerians as well as the development of technological capacities in the area of clean technologies such as zero emission vehicles (ZEVs). It will also require the adoption of integrated land use and transportation systems that will connect housing, jobs, schools, and communities through a variety of integrated low-carbon mobility solutions. In the urban areas, emphasis will be on (i) expansive adoption of mass transit system such as the Rail and Bus Rapid Transport (BRT) to reduce number of commuter vehicles on the road and curb emission; and (ii) encouraging the acquisition and use of zero-emission vehicles such as electric cars.

The long-term vision in the transport sector that can move the country toward carbon neutrality is ***a national transportation system by 2050 with all having access to a range of affordable transportation choices in which not more than 50% of all journeys are by cars, at least 40% of all journeys are by public transport (including trains and BRT) and at least 10% of all journeys are by active travel (e. g. cycling, walking) to generate little to no GHG, keep the air clean, reduce vehicle distance traveled while increasing access and grow the economy.***

Increased transportation efficiency and ubiquitous, safe, and affordable access to low-carbon transportation options are key to the success of the vision.

---

<sup>28</sup>Eleri, E. O., Onuvae, P. and Ugwu, O. (2013): Low-carbon energy development in Nigeria: Challenges and opportunities. IIED

<sup>29</sup><https://www.worldometers.info/co2-emissions/nigeria-co2-emissions/>

## 4.8 Waste

Waste generation has consistently increased in Nigeria due to increase in population, intensification in socioeconomic development, industrialization, changing lifestyles and consumption patterns. The quantity and rate of solid wastes generation in Nigeria have outgrown the capacity of existing facilities and structure put in place to manage them, therefore this has been of great concern across many Nigerian cities. Domestic solid waste generation rate per annum in Nigeria is currently estimated at 63 million tonnes (0.45 kg/capital/annum) and is increasing<sup>30</sup>.

The Third National Communication indicates that waste sector in Nigeria accounts for about 4% of the total net national emission of 609,783Gg CO<sub>2</sub>-eq. This is expected to increase over the years due to increasing resource use by the rapidly increasing population of the country that is set to reach over 400 million by 2050.

The poor management of waste in Nigeria has led to indiscriminate disposal or discharge of waste into unintended ecosystem, thus causing blockages of drainages channels and diffused flooding; degradation of aesthetic values of cities across the nation; uncontrolled burning of wastes and emission of poisonous gases into the atmosphere; leachate contamination of water and soil resources; pollution from discharged toxic wastes amongst others. These constitute both environmental and health hazards and contribute to GHG emissions from the sector and across the waste management chain including collection, transportation, treatment, and landfill. These uncontrolled emissions in turn contribute to the negative impacts of global warming issues across the globe. The largest source is usually landfill methane (CH<sub>4</sub>), followed by wastewater CH<sub>4</sub> and nitrous oxide (N<sub>2</sub>O); in addition, minor emissions of carbon dioxide (CO<sub>2</sub>) result from the incineration of waste containing fossil carbon (C) (plastics; synthetic textiles).

The key approaches to waste handling for GHG removals and overall climate mitigation include recycling, waste reduction, waste to wealth and energy recovery from wastes. The main policy direction is to significantly lower emissions from the sector with appropriate waste management and wastewater treatment solutions. Emphasis will be on post-consumer urban solid waste, as well as emissions from municipal wastewater and industrial wastewaters. Other areas of focus may include pre-consumer GHG emissions from waste within the industrial and energy sectors, agricultural wastes and manures and forestry residues. A wide range of mature, environmentally effective technologies will be deployed to mitigate emissions and provide public health, environmental protection, and sustainable development co-benefits, such as an improvement in air quality, a reduction in contamination-related illnesses, economic growth, and a boost to energy resources.

The objective is to sustainably reduce GHG emissions in the sector through the implementation of an integrated solid waste management strategy, including targeting waste prevention, recycling, composting, energy recovery, treatment, and disposal, which can have a significant impact on reducing GHG emissions. A strategic approach will be to reduce the amount of waste generated at source and create a virtuous cycle where resources are renewed, reused, or recycled repeatedly within a circular economy framework. This could be achieved by maximizing resource efficiency

---

<sup>30</sup> FME (2018): National Policy on the Environment

and minimizing resource inputs throughout the entire product life cycle – from extraction of natural resources to production, distribution, and consumption of products, to recycling and disposal of waste.

The national *vision is the reduction of GHG emissions from the sector by at least 50% by 2050, while transiting to a carbon-neutral waste management at the end of the century through expansive adoption of up-to-date technologies for solid, liquid, and gaseous waste (MSW) processing and other emerging technologies.*

#### **4.9 Cross-cutting: Gender inclusion**

There is a global recognition that women play an important role in climate change adaptation and mitigation because of their roles in core climate change sectors: farming and livestock management, energy, disaster risk reduction, transport, forestry, water management and health. An analysis by the UNDP (2016) indicates that women participate in mitigation-related activities through their selection and use of fuel for cooking and household tasks as well as transport-related needs and practices, they are important energy users, suppliers and consumers, and household energy managers and savers; thereby potentially capable of contributing to GHG mitigation that in the long-term move the world towards carbon-neutrality. Because of the different roles and responsibilities of women and men, which vary by socioeconomic level as well as by region, there are gender differences in the impacts of climate change, responses to climate change, vulnerabilities to climate change, and the capacities to adapt. Moreover, women’s local and environmental knowledge and survival strategies are major ingredients for recovery and resilience (UNDP, 2016)<sup>31</sup>.

Envisioning a gender-based just, long-term low emission strategy for Nigeria will require a whole of society approach that intentionally seeks to close pervasive gender inequality gaps skewed against women as well as leveraging on opportunities that low carbon development might open for a sustainable future. The national approach will be to adopt the general UNFCCC principles of<sup>32</sup>:

- Ensuring the equal participation of men and women in decision-making and implementation around adaptation and mitigation.
- Ensuring that women can act as agents of change at different levels of the adaptation and mitigation process.
- Promoting mitigation approaches that are aware of gender implications and outcomes and working towards gender equality and positive impacts on the lives of women through improving livelihoods and health and allowing time for the pursuit of additional opportunities.
- Adoption of clean, sound, socially appropriate and gender responsive technologies; among others.

A gender aware technology assessment for low carbon development will ensure gender is mainstreamed and harmful and/ risky technologies are locked out. Overall, the focus shall be to ***mainstream gender considerations into all actions and leverage on existing forward-looking***

---

<sup>31</sup> UNDP (2016): Gender Equality in National Climate Action: Planning for Gender-Responsive Nationally Determined Contributions

<sup>32</sup> UNFCCC website, “Gender and Climate Change”, [unfccc.int/gender\\_and\\_climate\\_change/items/7516.php](http://unfccc.int/gender_and_climate_change/items/7516.php)

*practices to foster equitable institutions and systems for a paradigm shifting transition to net zero carbon and climate resilient future that will benefit all equally.*

The vision should successfully mainstream the gender equality and social inclusion initiatives (GESI) and capture inclusivity for women, aged people, youth and persons living with disabilities by actions to embed affirmative action policies.

## **5 Role of Innovation**

Achieving a low emission development future for Nigeria in the context of the projected population increase and economic growth requires that a strong emphasis be placed on the role of innovation. There will be needed to embed technological, policy, governance, economic and environmental innovation, among others.

### **5.1 Social Innovation**

Social change necessitates social innovation to reorient societal values. In transitioning to a carbon neutral future there is the imperative for social innovation to produce green cities who consume and relate with nature equitably. A genuine transition to a green economy demands fundamental changes to both macro-economic and micro-economic conditions—and, therefore, institutions. Business as usual with respect to economic policy is not a viable alternative to meet the challenges of the future demands of mankind's desire to fundamentally redesign things and create new institutions without re-thinking social innovations that suit new demands.

### **5.2 Economic Innovation**

The tension and lack of progress witnessed in the implementation of climate action so far in Nigeria is largely due to different goals and aspirations pulling the nation in different directions. Nigeria has expressed a long-term aspiration to be a low carbon and climate-friendly economy, but prevailing economic circumstances have often imposed constraints over the abilities of government to take a low carbon route to development mainly due to the significant investments required for infrastructure and other costs. Nigeria's long-term Vision encapsulated in the Vision 20:2020 blueprint (to be revised) and the ERGP was to make the country a high middle-income economy, but with little consideration for low carbon development approach. Conversely, in the Paris Agreement the nation also acceded to carry out aggressive and binding cuts in her GHG without having the budgets to make it happen. To plant the country firmly on an LTS path, there is a need to redefine the economic innovation approaches to diversify the economy and address the unacceptable trade-offs between economic growth and environmental sustainability.

### **5.3 Technological Innovation**

Innovation in technology is essential for achieving Nigeria's LTV. Technological innovations utilize advance technologies to mitigate climate change. Globally, much of the progress made in decoupling emissions from development in the energy sector has come from technology innovation including in generation, storage, energy efficiency and Carbon Capture and Storage (CSS) and renewable energy. Fastest advancement have been made where there is technological convergence, a process where merging, blending, integration, and transformation of independent technologies leads to a completely new converged technology. This broad and complex concept encompasses a wide range of technologies, including the internet of things (IoT) and smart home devices. Examples include TV, internet, phones, home –smart, climate Smart Agriculture, energy-smart and water-smart technologies. It is vital that Nigeria invests in promoting these technologies, along with the diffusion of indigenous technology innovations as a thrust for its LT-LEDS.

### **5.4 Environmental Innovation**

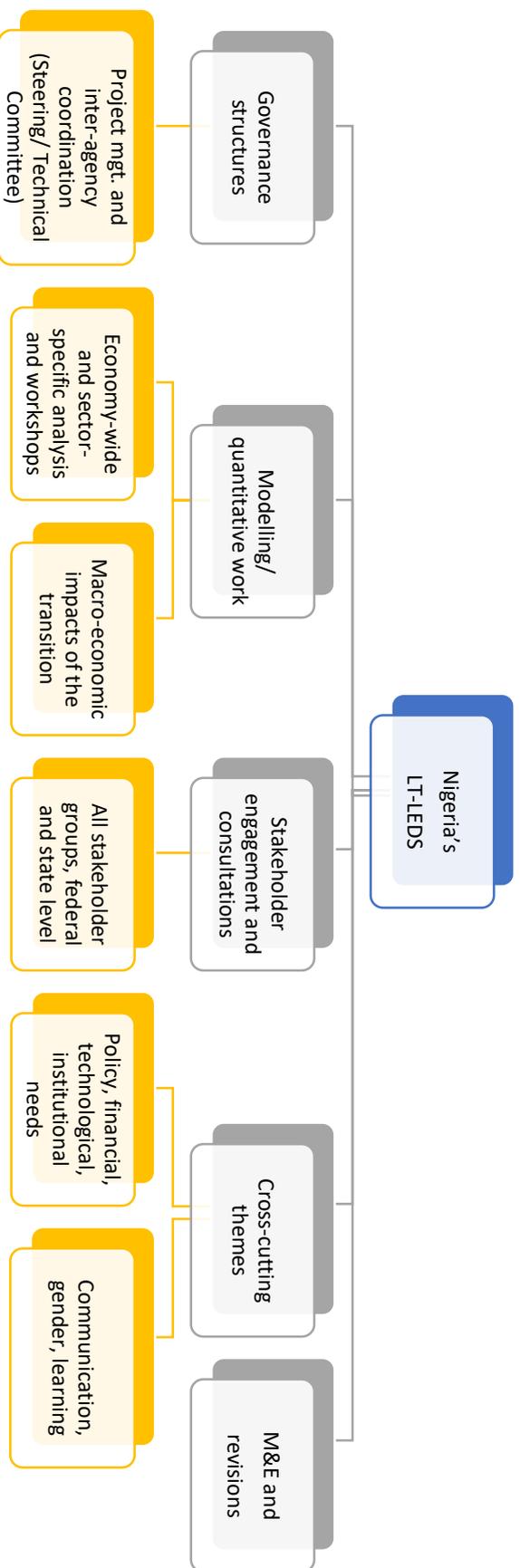
Nigeria's LTV deserves environmental innovation that is focused on organizational implementation and change. Environmental innovation encompasses many different aspects including economic, social, and technological change in way of doing things designed to promote environmental integrity. The focus is on the environment, with implication for products, manufacturing processes and marketing with degrees of novelty. It includes emphasis on conversation but also distribution of wealth within the nation to reduce disparities between rich and poor and achieve social and economic justice. It calls for precaution and the use of science to enhance social and environmental outcomes, through the identification of environmental risks and externalities as well as incorporating such externalities in national economic accounting frameworks. It entails using strategic, coordinated, and integrated planning to deliver sustainable development, the green economy and poverty alleviation but also that citizens should have access to information concerning the environment, as well as the opportunity to participate in decision-making processes.

## 6. Way Forward and Elaboration of the LT-LEDS

Nigeria's LTV has been validated and launched at the highest level of governance in Nigeria. It can thus be submitted to the UNFCCC under Art 4.19, as Nigeria's first contribution towards the elaboration of its LT-LEDS. The LTV lays a solid foundation for the elaboration of Nigeria's robust LT-LEDS and identifies the critical dimensions that policy-makers, private sector and society at large will need clarity on, to get on track for a low-carbon, climate-resilient transition.

It is anticipated that the LT-LEDS for Nigeria will be developed and pursued in a robust and consistent manner that will take the nation to 2050 on a low-carbon trajectory for the next 30 years.

Tentative building blocks for the elaboration of Nigeria's LT-LEDS are presented in Figure 4. The questions posed by stakeholders that will guide the LT-LEDS process are presented in Annex I. Annex II provides the suggested process(es) for inclusiveness and robustness by stakeholders to be considered during the elaboration of Nigeria's LT-LEDS.



**Figure 4: Proposed pathway for Elaborating Nigeria's Full-blown Long-Term Strategy**

## Annex 1: Critical Questions/Subjects for LT-LEDS Elaboration

FOCAL AREAS	KEY QUESTIONS
<b>Political Will</b>	<ol style="list-style-type: none"> <li>i. Is there a high-powered commitment from the President in support of LT-LEDS?</li> <li>ii. Is there any legislative instrument that supports the process?</li> </ol>
<b>Inventory of existing national policies and strategies</b>	<ol style="list-style-type: none"> <li>i. What national development programmes/strategies exist?</li> <li>ii. What national climate change programmes or strategies exist?</li> <li>iii. How linked are the two (i.e National development strategies and national climate change strategies)?</li> <li>iv. Out of the two, have we identified and prioritized our national strategies to address the challenges of climate change?</li> <li>v. Which priority sectors will be considered in the transition to LT-LEDS?</li> <li>vi. Do we have required data, modeling or scenario-building frameworks that could be used to support the development of LT-LEDS?</li> <li>vii. Are the prioritized strategies Specific, Measurable, Achievable, Realistic and Time-bound (<b>S.M.A.R.T</b>)??</li> </ol>
<b>Alignment of Nigeria's NDC with LT-LEDS</b>	<ol style="list-style-type: none"> <li>i. What are the links between Nigeria's NDC and LT-LEDS?</li> <li>ii. Are there short-term actions in NDC that can inform long term opportunities in the LT-LEDS?</li> <li>iii. Are there clearly defined institutional and legal frameworks to ensure synergy in the implementation of NDC and LT-LEDS?</li> </ol>
<b>Institutional framework</b>	<ol style="list-style-type: none"> <li>i. Which Ministry will serve as National Focal Institution to drive the LT-LEDS process?</li> <li>ii. Will the LT-LEDS process be driven by a Presidential taskforce? Has the taskforce been set up? Will the taskforce be independent and free from political interruptions? Will it change with change in government? What are the roles and responsibilities of the Taskforce?</li> <li>iii. Which relevant MDAs will participate in the LT-LEDS process?</li> <li>iv. Is there a team of national technical experts to set up the process and develop the strategy or is there needed to find capacity elsewhere?</li> <li>v. In which areas/sectors do we require capacity building?</li> </ol>
<b>Stakeholders Participation</b>	<ol style="list-style-type: none"> <li>i. Which stakeholders need to be engaged in the LT-LEDS process?</li> <li>ii. How will representatives of the MDAs at the Federal, State and Local Government, civil society, the private sector be selected?</li> <li>iii. Which key issues will be discussed with them?</li> <li>iv. At what stage (s) of the LT-LEDS process will they be engaged?</li> <li>v. How regular will the consultation be?</li> <li>vi. How will the stakeholder engagement process feed into the institutional setup for the LT-LEDS?</li> <li>vii. Is there a grievance redress mechanism in place?</li> </ol>
<b>Funding mechanism</b>	<ol style="list-style-type: none"> <li>i. Have the Ministries of Finance of Budget and Planning been consulted on the LT-LEDS process?</li> <li>ii. Does Nigeria have a long-term vision for climate finance?</li> </ol>

## Annex 1: Critical Questions/Subjects for LT-LEDS Elaboration

	iii.	Does Nigeria have a plan for increasing climate investment?
	iv.	How can the private sector be involved in the LT-LEDS process?
<b>Monitoring, verification, and Reporting</b>	i.	Is there a system to monitor, verify and report the LT-LEDS in Nigeria?
	ii.	Which MDAs will conduct the MRV?
	iii.	Are there key performance indicators and templates/ frameworks to monitor progress and assess results?
	iv.	How frequently will successes be measured?
	v.	Is there a mechanism to monitor national and/or international flows of climate finance for implementation of LT-LEDS?
	vi.	How will successes be communicated?

### Additional Critical Questions Raised by Stakeholders for Strategy Development

1. What profound changes are required in development and deployment of negative-emission technologies?
2. Will emerging positive economic growth be sustainable or sufficient to keep us within the planetary boundaries?
3. What type of economic growth can result from ambitious long-term climate policies and improved productivity?
4. What costs to the environment will result from the pursuit of economic growth? What significant economic damage would result?
5. What pattern or manner of decoupling of the economy will result in low emission to support in reach the world's 1.5 °C target?
6. Do we have negative-emission technologies (NETs) that would safely and permanently remove carbon already accumulated in the atmosphere in Nigeria?
7. How will a shift to more circular business models reduce CO2 emissions and help cut the use of materials and natural resources while maintaining economic growth?
8. An end of international funding for gas as a fossil fuel would create dire challenges for gas-producing countries, especially in Africa, as recently said by the Vice President, Prof. Yemi Osinbajo on the path of ensuring continued access to affordable, reliable energy for its populace, and transitioning to the use of cleaner energy in line with the net-zero emissions global target<sup>33</sup>. What are the challenges and how could these be overcome?
9. What critical blind spots exist in attaining green water objectives by 2050?
10. What promise does long-term (2050) green water transition vision hold for climate actors?
11. What paradigm shifts are needed to deliver a low carbon industry, for example in water infrastructure, scale of operations and technology options?
12. What associated behavioral change from consumers and companies will be needed and how could enabling reform strengthen program success?
13. Are the mechanisms to deliver a low carbon industry in Nigeria already in place; for example, the use of shadow price of carbon and carbon reduction commitment from 2021?

<sup>33</sup><https://insidebusinessafricang.com/2021/04/16/osinbajo-seeks-fair-transition-towards-global-net-zero-emissions-target/>

## Annex 2: Suggested Process(es) for Inclusiveness and Robustness for the LT-LEDS Elaboration for Nigeria.

Although the Paris Agreement invited countries to formulate and communicate a LT-LEDS by 2020, the scope and elements to be included in the LT-LEDS are not clearly defined. For Nigeria to envision a low-emission development and national socio-economic development pathway in an integrated and strategic manner, a robust and an inclusive LT-LEDS is required. Key areas for consideration include but not limited to the following:

### **a. Policy alignment**

Nigeria's LT-LEDS process must be aligned with other national programmes and strategies such as ERGP, Mid-term National Development Plan and Agenda 2050, NDC, Climate Change and other related ones. Linking these policies and strategies will help Nigeria identify long-term opportunities from the short-term actions in the NDC, Climate change policy and other related national strategies.

### **b. Identification Entry points for the implementation of LT-LEDS**

An in depth understanding of national circumstances and national development priorities and existing climate strategies can constitute important entry points for developing LT-LEDS. For instance, Nigeria's NDC and Climate Change policy have already identified priority climate mitigation and adaptation opportunities. There are existing institutional and regulatory frameworks in place that can be leveraged and improved upon through lessons learned for the development of the LT-LEDS.

### **c. Strong Interagency coordination**

The LT-LEDS process will require strong interagency collaboration and coordination across Federal, State and Local governments as well as the private sector to establish a unified effort and to maximize available resources in a collaborative manner.

### **d. Stakeholder's engagement**

To create the support needed for the LT-LEDS in the short-, medium- and long-run, strong stakeholders' engagement is required. Involving the public through regular stakeholder consultations processes will contribute to improving the quality of the LT-LEDS.

### **e. Robust finance and investment**

The LT-LEDS process will only succeed if there are clear roadmaps for sustainable funding and investment.

### **f. Robust MRV**

There will be need to have clear mechanisms and templates for monitoring, reporting, and verifying the LT-LEDS process.