



# NIGERIA'S NATIONALLY DETERMINED CONTRIBUTION

# NIGERIA'S FIRST NATIONALLY DETERMINED CONTRIBUTION – 2021 UPDATE



Submitted by

**THE FEDERAL GOVERNMENT OF NIGERIA**

Being a requirement under

**Article 4.2 of the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC)**

Prepared by the

**Federal Ministry of Environment, Abuja**

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## Executive summary

Nigeria is pleased to submit its final updated Nationally Determined Contribution (NDC) to the UN Framework Convention on Climate Change. This has been approved by the Federal Executive Committee and duly signed by HE President Mohammadu Buhari (GCFR), and replaces the interim updated NDC that was submitted on 27 May 2021.

Nigeria, Africa's largest economy, has a key role to play in delivering the aims of the Paris Agreement in the continent of Africa. Today, one fifth of Africans, some 200 million people, are Nigerians. The World Bank projection is that Nigeria will become the world's third most populous country by 2050 with over 400 million people. As a country that is both highly vulnerable to the impacts of climate change, and also one of the largest emitters of GHG emissions across Africa, Nigeria has an important leadership role.

The economic fundamentals and development priorities haven't changed since 2015: Diversification of the economy and growth in non-oil revenue are essential to job creation by MSMEs, especially for youth. The fight against poverty and improving food security remain top priorities for the government. Enabling this economic growth requires sustainable debt levels and stable revenue. To accelerate development, large investments continue to be made in infrastructure and the power sector.

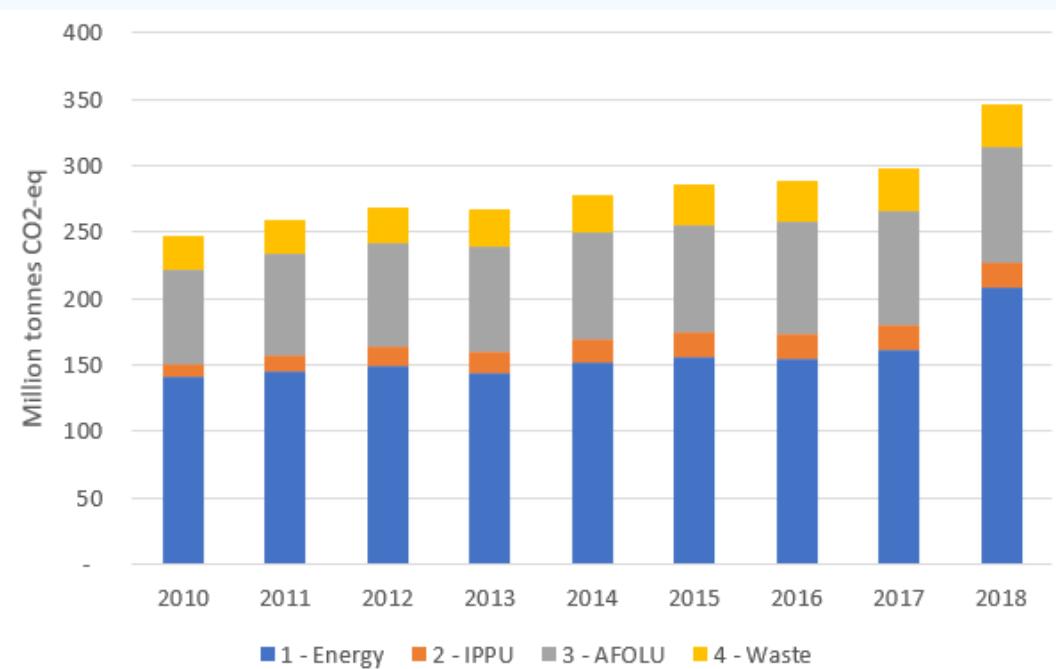
The Federal Government of Nigeria in 2015 submitted an ambitious and transparent NDC. As a lower-middle income economy, Nigeria was among the few developing countries to set an economy-wide target. It, however, notes with concern that the collective ambition of all NDCs submitted falls well short of the Paris Agreement objectives. This updated NDC represents significantly enhanced climate ambition as compared to the 2015 NDC.

Nigeria has raised its ambition in this updated NDC, by including emissions reductions from the waste sector for the first time and increasing its conditional contribution. Hence this updated NDC has an unconditional contribution of 20% below business-as-usual by 2030 and now has a 47% contribution conditional on international support. Committing to this level of climate ambition in the face of lower-than-expected economic growth represents a significant enhancement, as it will result in substantially lower *absolute* GHG emissions than stated in the 2015 NDC. The scale of the emissions reductions – a 47% conditional contribution of around 100 MtCO<sub>2</sub>e below current (2018) levels – is consistent with a global 1.5°C pathway. Mobilization of the requisite international support and private sector investment would enable Nigeria to peak GHG emissions peak this decade.

Nigeria enhanced ambition is achieved in the following ways:

1. In developing Nigeria's updated NDC, **a substantially larger volume of information is available**. This information improves both the estimates of total GHG emissions in Nigeria (historically and for the baseline projection) and the GHG mitigation potential of particular GHG reduction measures. In particular, an enhanced energy balance and a Forest Reference Emissions Level report validated by UNFCCC experts has been prepared.

2. The country has updated the base year for the GHG assessment from 2010 to 2018. The total emissions of greenhouse gases estimated between 2010 and 2018 range between 247 million tonnes CO<sub>2</sub>-equivalent (MtCO<sub>2</sub>e) emissions in 2010 and 347 MtCO<sub>2</sub>e in 2018. The energy sector was the largest source of GHG emissions with 209 MtCO<sub>2</sub>e emitted in 2018 (60% of total emissions). Fugitive emissions from oil and gas are the largest contributor to overall energy



Total GHG emissions in Nigeria between 2010 and 2018 (units: million tonnes CO<sub>2</sub> equivalent emissions).

sector emissions (36% of total energy sector emissions in 2018), followed by transport, electricity generation (grid and off-grid), and residential and industrial energy consumption. Agriculture, Forestry and Other Land Use (AFOLU) is the second largest contributor to total GHG emissions, contributing approximately 25% of national GHG emissions in 2018, following by waste (9%), and Industrial Processes and Other Product Use (IPPU) (5%).

3. The 2015 NDC covered emissions for three greenhouse gases: CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. The NDC greenhouse gas mitigation target now covers four greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and HFCs). The GHG mitigation assessment has been expanded to cover 11 pollutants in total, including short-lived climate pollutants (black carbon) and air pollutants (PMs, NO<sub>x</sub>, SO<sub>2</sub>, NH<sub>3</sub>, OC, NMVOCs and CO) to evaluate the co-benefits of mitigation measures in reducing these substances, alongside GHGs.
4. In Nigeria's 2015 NDC, historical GHG emissions were estimated for 2010-2014, and then projected into the future based on a 5% per year GDP growth rate. As a result, in the 2015 NDC baseline projection, total GHG emissions were estimated to increase to 898 MtCO<sub>2</sub>e in 2030. These projections have now been refined and recalculated, using updated and improved estimates of key parameters such as GDP growth, taking into account the economic impact of the coronavirus pandemic, and Nigeria's expected recovery. For example, GDP growth from 2015 - 2021 was less than previously projected and adjusted growth projections for the period 2021- 2030 are now available.

In the updated baseline projection, GHG emissions for Nigeria in 2030 are now estimated to be 453 million tonnes CO<sub>2</sub>-eq emissions, *around half of those predicted in 2015*. This represents a 31% increase in total GHG emissions between 2018 and 2030, or a 2.6% per year increase in total GHG emissions, which is consistent with historic trends. Energy and Agriculture, Forestry and Other Land Use continue to be the largest single sources of GHG emissions, contributing 51% and 33% to total GHG emissions in 2030 respectively. As well as the increase in GHG emissions, SLCP's and air pollutants, such as black carbon and PM2.5, are also

projected to increase to 2030 in the baseline scenario, by 33% and 41% respectively. In addition, the GHG emissions associated with waste and HFC sectors have been included in this updated NDC, after not being included in the 2015 submission. Therefore, the relative emission reduction targets now apply across a more complete range of GHG emission sources compared to in 2015.

**Despite the fact that under ‘business-as-usual’ conditions, emissions in 2030 are now expected to be significantly lower in absolute terms than had been expected at the time of writing the 2015 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.** This level of climate ambition in the face of lower-than-expected economic growth (and the revised baseline projection) represents a significant enhancement as it will result in substantially lower absolute GHG emissions than stated in the 2015 NDC. The fact that these targets will be achieved in only 9 years is further evidence of Nigeria’s climate ambition.

5. The ICTU table annexed to this submission provides further methodological information. **The ICTU table as prepared allows for a comparison with the 2015 NDC**, in what is hoped is a useful further transparency element. Nigeria wishes to encourage such best practice to be adopted by all countries in future NDC revision rounds.
6. In addition to recommitting to the ambitious targets set out in the INDC, **Nigeria has also expanded the scope of the updated NDC**. As announced by HE President Mohammadu Buhari (GCFR), **the updated NDC includes an enhanced contribution by the waste sector**, for which the 2015 NDC lacked abatement figures due to a lack of reliable data. **The 2021 NDC update also covers the water resources sector, and articulates other nature-based solutions not included in the 2015 NDC**.
7. Since submitting the first NDC, a number of **new specific policy commitments** have been made by the Federal Government of Nigeria in order to implement the unconditional contribution announced in the 2015 NDC. These include, among others, elimination of kerosene lighting by 2030, a greater uptake of bus rapid transit, a 50% reduction in the fraction of crop residues burnt by 2030, implementation of forest programmes and initiatives to deliver 20% GHG emission reductions and enhanced removals equivalent to approximately 74.2 MtCO<sub>2</sub>e by 2030, and ratification of the Kigali Amendment to the Montreal Protocol to phase out HFCs.
8. A further aim of the 2021 NDC update is to **mainstream gender across all sectors**. To this end, the Federal Executive Council in 2020 approved the National Action Plan on Gender and Climate.
9. Nigeria has, with support from UNDP, GIZ, IRENA, the Islamic Development Bank and other development partners, in a coalition of development partners contributing through the NDC Partnership, carried out a significant enhancement program as part of the NDC update. This includes:
  - a. Updated analysis of mitigation in the electricity sector.
  - b. Assessment of the scope for increasing access to off-grid clean electricity.
  - c. Revised data and emissions projections for the forestry sector.
  - d. Analysis of emissions reductions from refrigerant gases (HFCs) and alignment with Nigeria’s obligations under the Kigali Amendment to the Montreal Protocol.
  - e. Analysis of nature-based solutions for those sectors with significant adaptation and mitigation co-benefits.
  - f. Assessment of green jobs in Nigeria.
  - g. A review of circular economy and waste management.
  - h. Review of clean cooking solutions in Nigeria.

All of the above was carried out through a whole-of-society approach. The process to update the NDC was a collaborative and inclusive one, involving a range of stakeholders, led by the Federal Ministry of Environment, supported by UNDP and the NDC Partnership and in close consultation with all relevant MDAs, the States, private sector, and civil society organisations.

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## Glossary

Abbreviation	Definition
AfCFTA	African Continental Free Trade Area
AfDB	African Development Bank
AFOLU	Agriculture, Forestry and Land Use
BAU	Business As Usual
BRT	Bus Rapid Transit
BUR	Biennial Update Report to the UNFCCC
CAEP	The NDC Partnership's Climate Action Enhancement Package
CAEP IP	CAEP Implementing Partner
CDM	Clean Development Mechanism
CFA	Climate Finance Accelerator
CH4	Methane
CNG	Compressed Natural Gas
COP	Conference of the Parties
CO <sub>2</sub>	Carbon Dioxide
DRR	Disaster Risk Reduction
ECOWAS	Economic Community of West African States
ERGP	Economic Recovery and Growth Plan
ETF	Enhanced Transparency Framework
FGN	Federal Government of Nigeria
FREL	Forest Reference Emission Level
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HFC	Hydrofluorocarbon
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
IRENA	International Renewable Energy Agency
K-CEP	Kigali Cooling Energy Programme
LULUCF	Land use, Land Use Change and Forestry
MDA	Ministries, Departments and Agencies of the Federal Government of Nigeria
MSMEs	Micro, Small and Medium Size Enterprises

NBS	Nature Based Solutions
NC	National Communication to the UNFCCC
NEMA	Nigeria Emergency Management Agency
NESP	Nigeria Economic Sustainability Plan
NESREA	National Environmental Standards and Regulations Enforcement Agency
NDC	Nationally Determined Contribution
NDCP	NDC Partnership
NGN	Nigerian Naira
N <sub>2</sub> O	Nitrous Oxide
SDGs	Sustainable Development Goals
SLCP	Short Lived Climate Pollutant
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	US dollars

## Foreword



**Dr. Mohammad Mahmood Abubakar**  
HONOURABLE MINISTER  
FEDERAL MINISTRY OF ENVIRONMENT

The Paris Agreement is an incredible opportunity for Nigeria to follow the path of Low Carbon Development, which will in turn facilitate sustainable development. It is in this regard that, Nigeria's updated Nationally Determined Contribution (NDC) has unconditionally pledged a 20% emissions reduction below Business as Usual (BAU) by 2030, and a 47% conditional commitment which can be achieved with financial assistance, technology transfer and capacity building from the more advanced and more willing international partners. We are taking these ambitious pledges irrespective of low economic growth and putting into consideration the myriad of challenges attributable to the COVID 19 pandemic, this demonstrates our commitment to play the leading role on sustainable development in Africa. The vision of our NDC is fully aligned with the Sendai Framework on Disaster Risk Reduction,

sustainable Development Goals and Nigeria Economic Sustainability Plan.

We are focusing on electricity access to all Nigerians, Green jobs by diversifying the economy, Just Transition, projecting to Net Zero trajectory, Sustainable Waste Recycling, Clean Cooking, providing a healthy environment and, importantly, driving economic development, while mainstreaming the issues of Gender. We are committed to transforming our climate action plans into results by turning international discuss into pragmatic steps. Full ownership and commitment to the NDC by relevant Ministries, Departments, and Agencies (MDAs) is in fact crucial to delivering on pledges, and essential in order to mobilise the international support, which was part of the Paris package. With this spirit in mind, we will revise our implementation roadmap to reflect the expanded Mitigation Measures in the revised 2021 NDC.

Again, Nigeria has included Short Lived Climate Pollutants as additional gases in the new NDC and also set target for methene reduction in the Oil & Gas Sector, as well as pledge to support the Montreal Protocol, removing ozone-destroying pollutants from our atmosphere, which offers the opportunity to further alleviate planetary warming. The Paris Agreement is succeeding as the climate change and development agenda can no longer be set by the global north for the global south, it has to be set by and for all - and the NDC is Nigeria's own plan of action to contribute to this international agenda. We must use the Paris Agreement to promote a national decarbonization pathway, low-carbon but high growth development agenda.

The development of our country is my highest priority, and for my ministerial team national development and the implementation of our NDC is also about leaving no one behind. We are glad that this NDC was widely owned by all relevant stakeholders both Federal, Sub-National, MDAs, Private and Civil Society Organizations. We are well aware, however, that everyone has a part to play, and we are ready to engage all toward actualising this change. This inclusive approach recognises the importance of aligning national development priorities with maintaining the political support needed for NDC realization. I would like to take a moment here to echo the comments of our President, H.E. Mohammadu Buhari, when he commented on his great optimism on the future of Nigeria and Africa; "I believe that the greatest reason for optimism is in the incredible energy, talent and creativity of our young people, male and

female who are completely undeterred by the failures of the past and are daily taking advantage of innovation and technology bringing about Nigeria of our dreams.”

Going forward, Nigeria's national budget will be a green budget to reflect Nigeria's efforts to realising its NDC. In addition, we are setting out to issue our third Sovereign Green Bond to fund a pipeline of projects all targeted at reducing emissions towards a greener economy. I urge all sectors to embrace the opportunity provided by the sectoral Action Plans to conceive and implement actions towards a low-carbon economic development.

The Paris Agreement is a tremendous opportunity for the people of Nigeria; but only if we seize the opportunity with both hands. We must do that because we have no better option.

## 1 Introduction

Nigeria is pleased to submit this updated first NDC, building on the [INDC](#) that was submitted prior to the COP21 meeting in 2015, and that became its first NDC on ratification of the Paris Agreement in Nigeria in May 2017. It is from here on referred to as the 2015 NDC.

A new NDC, with a revised timeframe, will be submitted prior to 2025.

This updated NDC provides a high-level and strategic vision for climate action in Nigeria. It sets out what Nigeria commits to doing to support the implementation of the Paris Agreement, and in particular the aims of the Agreement set out in Article 2, to:

- Limit the increase in global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels;
- Increase the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development; and
- Make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

Like most countries, Nigeria also submits regular reports to the UN Framework Convention on Climate Change (UNFCCC), and has so far submitted three National Communications (NC) and one Biennial Update Report (BUR), with the most recent submissions being the [first BUR](#) in 2018 and the [third NC](#) in 2020. The NDC is not meant to replicate these documents, and whilst a high-level picture is given here in the NDC, the reader can refer to the aforementioned documents for more details, such as on national circumstances, the GHG inventory, mitigation actions, adaptation priorities and support needs. The information required for clarity, transparency and understanding, as required under the Paris Agreement and set out in Decision 4/CMA.1<sup>1</sup>, is set out in Appendix A and elaborated on throughout this updated NDC.

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<sup>1</sup> [https://unfccc.int/sites/default/files/resource/cma2018\\_3\\_add1\\_advance.pdf#page=6](https://unfccc.int/sites/default/files/resource/cma2018_3_add1_advance.pdf#page=6)

## 2 National context and vision

### 2.1 Vision

Nigeria, Africa's largest economy, has a key role to play in delivering the aims of the Paris Agreement in the continent of Africa. Today, one fifth of Africans, some 200 million people, are Nigerians. The World Bank projection is that Nigeria will become the world's third most populous country by 2050 with over 400 million people. As a country that is both highly vulnerable to the impacts of climate change, and also one of the largest emitters of GHG emissions across Africa, Nigeria has an important leadership role.

By implementing the *Economic Recovery and Growth Plan* (ERGP), the government has focused on driving economic expansion and inclusive growth. The 2020 *Economic Sustainability Plan*, with which this NDC update is fully aligned, spells out Nigeria's response to the economic downturn resulting from international developments. The *Medium-Term Economic Growth Acceleration Plan 2021-2025* provides a detailed roadmap for the post-crisis era.

The economic fundamentals and development priorities haven't changed since 2015: Diversification of the economy and growth in non-oil revenue are essential to job creation by MSMEs, especially for youth. The fight against poverty and improving food security remain top priorities for the government. Enabling this economic growth requires sustainable debt levels and stable revenue. To accelerate development, large investments continue to be made in infrastructure and the power sector.

Nigeria's vision on climate change is set out in its recently updated *National Climate Change Policy, for 2021-2030* – to promote low-carbon, climate-resilient and gender-responsive sustainable socio-economic development. More recent work carried out in 2020 and 2021, to inform the development of a long-term low emission development strategy, has expanded on this from a 2050 perspective. The proposed vision is 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% and is moving towards having net-zero emissions across all sectors of its development in a gender-responsive manner.*

This vision therefore introduces some additional priorities, such as the development of a circular economy and gender equality. This new vision can only be achieved by properly embedding climate considerations into all aspects of the economy and society, and by mainstreaming the above vision into the nation's development and planning. This means being reflected in the proposed Agenda 2050 strategy, as well as nearer term National Development Plans. More information on links to such priorities are set out in Section 2.3 below.

### 2.2 National circumstances

Located just north of the equator in Western Africa, Nigeria is the continent's largest nation by population and its largest economy, covering an area of 923,769 square kilometers. A federal republic composed of 36 states and the Federal Capital Territory, it is among the world's most multicultural and ethnically diverse nations. English is the official language but over 250 languages are spoken.

Nigeria is a co-founding member of the African Union and a member of the Economic Community of West African States (ECOWAS) as well as the Organisation of the Petroleum Exporting Countries (OPEC). In 2019, Nigeria signed the African Continental Free Trade Area (AfCFTA) with a view to promoting tariff-free trade on the continent. In the context of the climate change negotiations, it is a member of the [African Group of Negotiators](#) (AGN). Detailed information on national circumstances in Nigeria are set out in the [Third National Communication](#) submitted in 2020.

Since preparing the 2015 NDC, Nigeria and its people have undergone two economic shocks with significant negative repercussions on society as a whole and on climate change resilience. The oil price shock (2014-2016) led to a reduction in the flow of foreign exchange and revenue to the government.

The Economic Recovery and Growth Plan (ERGP; 2017-2020) prepared in response to the oil price shock of 2014-2016, returned Nigeria to a path of economic growth. Leaving recession in mid-2017, the

country experienced eleven quarters of consecutive GDP growth, until the Covid pandemic hit the world in 2020. The fiscal and macro-economic response to the resulting recession has returned the country to growth, be it at a lower level than expected. The pandemic, and the resulting economic impact, continue to depress the economy.

In nominal terms, the size of the Nigerian economy in the first quarter of 2021 stood at N40 trillion (US\$105.5 billion). Although the pandemic is not over, a gradual improvement in economic activities is taking place, largely driven by the non-oil sector which accounted for 91% of total real GDP. The key contributors to growth were the agricultural and industrial sectors, with a combined share of 46% in total real GDP. The oil sector accounted for 9% of real GDP and continues to be the largest source of revenue to the government. Core inflation stood high at 12.7% in March 2021.

## 2.3 National priorities

For climate action in Nigeria to be fully mainstreamed, this updated NDC needs to be viewed in conjunction with other key national priorities around development, inclusive economic growth, national security, health, nature protection and wellbeing and education. These priorities are communicated to the international community through Nigeria's Voluntary National Review on Sustainable Development Goals (SDGs).

In this section of the updated NDC, these national priorities as contained in three key strategies and plans are outlined, and explain how they relate to climate action.

### 2.3.1 The Nigeria Economic Sustainability Plan

The *Nigeria Economic Sustainability Plan* (NESP) was approved by the Federal Executive Committee in June 2020 and aims to chart a clear course out of the Covid-19 pandemic, by stimulating and diversifying the economy, retaining and creating jobs and extending more protections to the poor. The aim is to lift 100 million Nigerians out of poverty over the next 10 years. Key interventions include a Mass Agricultural Programme (MAP), an extensive public works programme, a Mass Housing Programme (MHP) and support for state governments. The updated NDC is aligned with the Plan and some of the actions specifically target this agenda. For example, the installation of Solar Home Systems targets 5 million households, serving about 25 million individual Nigerians who are currently not connected to the national grid.

### 2.3.2 Medium Term National Development Plan - 2021-2025

Following on the 2017 ERGP, the government set nine policy priorities for implementation during the period 2019-2023. With the preparation of the *Medium-Term National Development Plan* (MTNDP), the Federal Government of Nigeria envisions to “catalyze[d] the potential of the public, private, and social sectors to boost industrialization, and sustainably improve inclusive, holistic development and competitiveness.” The aim is to improve economic competitiveness with modest GDP growth of 3.8%, that drives job creation, generates inclusive national growth, and lifts at least 25 million Nigerians out of poverty. There is a strong focus on stimulating growth of MSMEs in non-oil sectors. Enabling this growth also depends on removing impediments to the delivery of reliable, affordable and clean electricity to MSMEs. This is arguably one of the defining challenges for government from the perspective of the Nigerian private sector, with a large impact on climate change policy.

### 2.3.3 Agenda 2050 and other long-term plans

The proposed *Agenda 2050*, currently under preparation by the Federal Ministry of Finance, Budget, and National Planning, is aimed at making Nigeria a socio-economically advanced nation with a technologically enabled, digitally connected, diversified and inclusive sustainable economy. It is the successor vision to the Nigeria Vision 20:2020. Agenda 2050 has a number of goals, including the lifting of 100 million Nigerians out of poverty by 2030. President Mohammadu Buhari (GCFR) has also underlined how it should also support other objectives, including the UN SDGs.

Under the lead of the Department of Climate Change, Nigeria has started the process of elaborating a long-term low-emission development strategy (LT-LEDS), as a contribution to the invitation under Article 4.19 of the Paris Agreement. The visioning work carried out in 2020 and 2021 that will inform

Nigeria's LT-LEDS has expanded on the initial vision set in the 2012 Climate Change Policy Response and Strategy from a 2050 perspective. The future quantification work that will be carried out in 2021 and 2022 to inform Nigeria's LT-LEDS will build on other ongoing in-country climate modelling exercises such as the Deep Decarbonisation Pathways project.

### 3 Progress so far

Nigeria has driven forward the climate change agenda energetically since the INDC was submitted, with significant progress being made on a number of fronts.

#### 3.1 Changes to emissions over the period

The updated analysis carried out to inform this NDC update showed that GHG emissions in 2018, the latest year for which data are available, were estimated to be 347 MtCO<sub>2</sub>e. This compares to the projected estimate of 2018 GHG emissions in the INDC, which was 474 MtCO<sub>2</sub>e. The specific reasons for the differences in historic GHG emissions between the INDC and the updated GHG mitigation assessment are difficult to disentangle, but are likely to include:

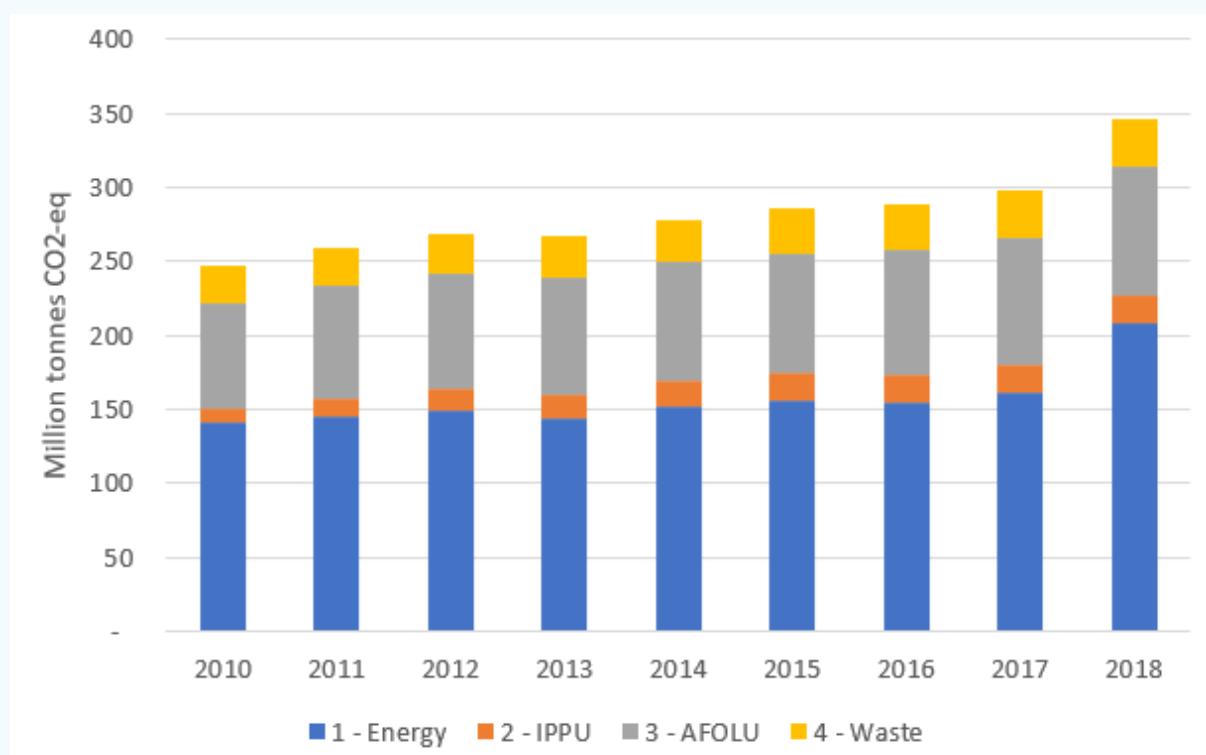
**Implementation of GHG mitigation measures:** The implementation of GHG mitigation measures in key sectors since the INDC was submitted may have contributed to lower GHG emissions in 2018 compared to what was envisioned in the INDC baseline scenario.

**Improvements in data and methodologies used to estimate GHG emissions in the updated GHG mitigation assessment for the 2021 NDC compared to the 2015 NDC.**

**Differences in the assumptions underlying INDC projections and the reality of GHG emission changes between 2015 and 2018.** The INDC submitted in 2015 assumed a sustained 5% per year GDP growth rate (approx. the historical rate for 2010-2014), which is reflected in the increases in GHG emissions in the INDC. This GDP growthrate has not occurred in Nigeria, and it might therefore be expected that GHG emissions have also not increased at the same rate as assumed in the INDC.

The changes to GHG emissions since 2010 are set out in Figure 1 below.

**Figure 1: Total GHG emissions in Nigeria between 2010 and 2018 (units: million tonnes CO<sub>2</sub> equivalent emissions)**



Between 2017 and 2018, a noticeable increase in total emissions is observed. This increase is due to the difference in historical data sources between 2010-2017 and 2018. For 2018, IRENA produced a report 'Enhancing energy statistics in Nigeria', which included an energy balance for Nigeria based on bottom-up methodology, where, for example, in the residential sector, national surveys were used to

calculate energy consumption by fuel type. The use of this data for 2018 can be considered to be more robust than the UNSD Energy Balance data used for the previous years, and cover key sectors such as off-grid electricity generation. The IRENA report has been endorsed by the Energy Commission of Nigeria (ECN) and has been validated by stakeholders.

## 3.2 Implementation of new policies and measures

A great deal of progress has been made in implementing climate action in Nigeria since the 2015 INDC was submitted. Following adoption of the 2015 NDC, sectoral action plans were prepared to guide NDC implementation in the five key sectors (agriculture, industry, power, oil and gas, and transport). Examples of some of the positive steps taken include:

In 2021, an updated National Climate Change Policy, for 2021-2030, was approved by the Federal Executive Council.

The approval in 2019 of Nigeria's [National Action Plan to Reduce short-lived climate pollutants \(SLCPs\)](#). The plan contains 22 priority measures that would result in an 83% reduction in black carbon emissions by 2030 and reduce methane emissions by 61%, as well as adoption and ratification of the Kigali Amendment to the Montreal Protocol aimed at the phase down of HFCs. With support from the Kigali Cooling Energy Programme (K-CEP) Nigeria promotes the transition to energy-efficient air conditioning using low-GWP natural refrigerants in residential, commercial and public buildings.

Nigeria has developed a new REDD+ Strategy (2021) and a National Forest Policy (2020), including a National Forest Investment Plan (2019 -2023). The objective of the National REDD+ Programme is to implement the forest sector plan for achieving Nigeria's Nationally Determined Contribution (NDC) aimed at reducing GHG emission

In 2017, Nigeria introduced its first Building Energy Efficiency Code, which sets minimum standards for energy efficiency for new buildings in Nigeria.

Implementation of Extended Producer Responsibility in the waste sector, with a focus on electronic waste.

The removal of the gasoline price cap, effectively removing that subsidy, in order to encourage a transition to cleaner fuels, such as gas.

The approval of Nigeria's Sustainable Energy for All (SE4ALL) Action Agenda in 2016, which has a target of almost tripling generation capacity in the next decade, to reach a total of 30GW by 2030. Of this, 30% will be generated from renewable resources, with almost half of this provided by medium and large hydro.

The Clean Energy Transport Scheme in major Nigerian cities involves the introduction of compressed natural gas (CNG) for buses in public transport.

Ratification of the ECOWAS fuel quality standards and vehicle emission standards, alongside the development of a National Vehicular Emission Control Programme and National Generator Emission Control Programme.

Nigeria [joined the Global Methane Alliance](#) in 2019. Countries who join the alliance commit to absolute methane reduction targets of at least 45% by 2025 and a 60-75% reduction by 2030. Since 2017, Nigeria has issued its first and second Sovereign Green Bonds, with the proceeds from the issuances funding various climate change projects and programmes. A third issuance is envisaged for 2021. Since 2017, Nigeria has participated in the Climate Finance Accelerator programme aimed at mobilizing blended finance for NDC-aligned investment.

A number of capacity building activities have been undertaken, including on MRV for key MDAs under the NDC, engagement with women in the private sector, support for State-level environment departments, etc.

## 4 Adaptation priorities

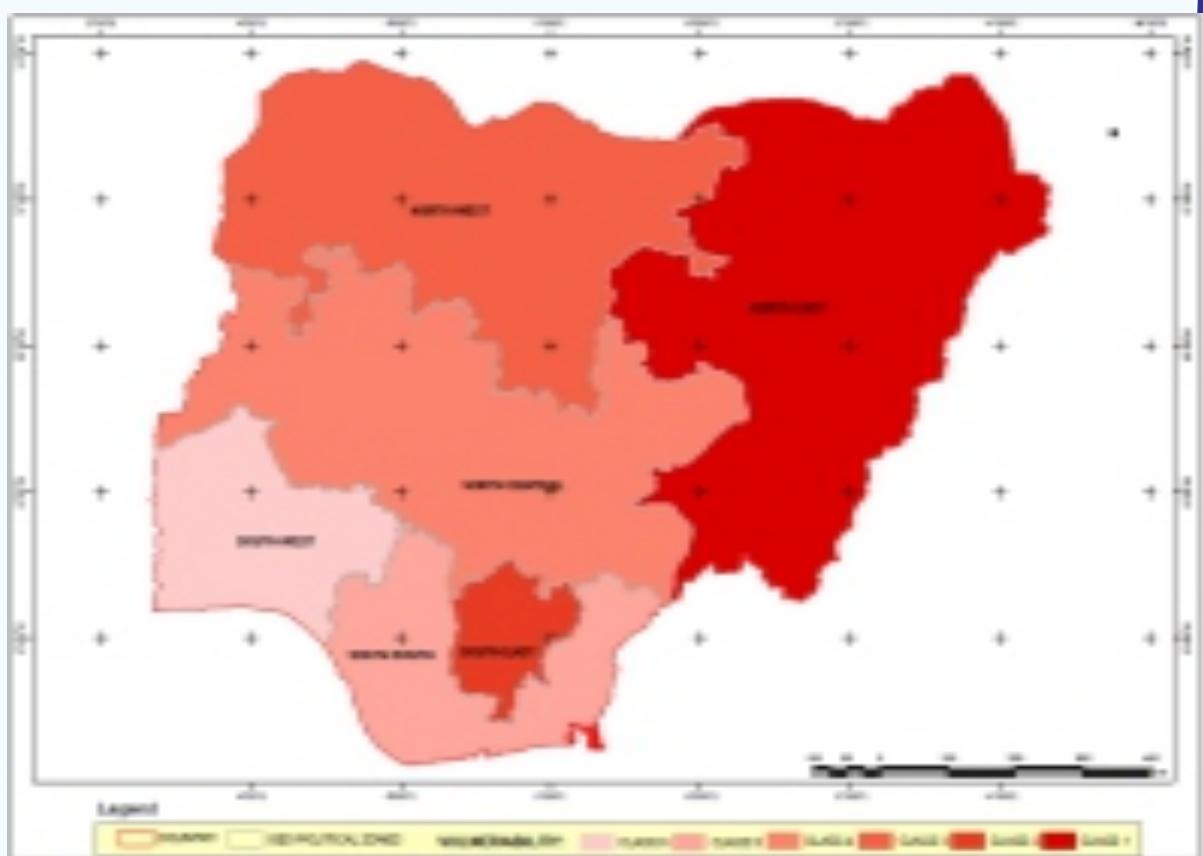
### 4.1 Background

Nigeria is highly vulnerable to climate change. The 2014 World Climate Change Vulnerability Index, published by the global risk analytics company Verisk Maplecroft, classifies Nigeria as one of the ten most vulnerable countries in the world. Extreme events and weather variability such as droughts, floods, erosion and sea-level rise all impact the nation.

The mid-century scenarios from the Fifth Assessment Report of the IPCC predict that the country could face wetter conditions in the southern part of the country and drier conditions in the northern part. A detailed discussion of both historical trends and projections, as well as sector-specific adaptation strategies may be found in the Third National Communication.

The government has determined vulnerability across Nigeria's geographical regions, focusing on the three principal determinants of vulnerability: adaptive capacity, sensitivity and exposure. The *relative vulnerability* of the six geopolitical zones of Nigeria is shown below. There is a general south-north divide. The three northern zones show higher vulnerability than those in the south. This reflects the higher rainfall and socio-economic development of the south. The south-south shows highest relative variability among the three southern zones, reflecting the challenges of coastal flooding and erosion, as well as the impact of petroleum exploration and exploitation in that part of the country.

Figure 2: Spatial variation in relative climate change vulnerability (Source: Second National Communication, 2013)



The southwest is least vulnerable, the northeast, on the other hand, is most vulnerable. Understanding these spatial vulnerabilities is crucial to shaping climate-resilient development in Nigeria.

Climate change is thought to be a contributing factor to the deteriorating security situation observed in parts of the country. The impact of these changes without adaptation could cost between 6% and 30% of Nigeria's GDP by 2050, amounting to between USD 100 billion and USD 460 billion<sup>2</sup>.

One significant event was the 2012 floods, which affected 7 million people in 30 of the 36 states, displaced 2.3 million people, and killed 363 (Amangabara & Obenade, 2015).<sup>3</sup> Its cost to the economy was at the time estimated to be NGN 2.6 trillion / USD 17.3 billion or 1.4% of GDP.<sup>4</sup> In 2018, the country was again struck, with floods affecting 12 states. Over 2 million people were impacted, with 199 deaths and over 4,000 people injured. More than 600,000 people were internally displaced. The damages to property and agriculture land were massive.

Following the 2012 floods, the Nigeria Emergency Management Agency (NEMA) and international partners prepared a capacity assessment of climate change risks and potential Disaster Risk Reduction (DRR) policy responses. The focus was on the agriculture sector and water resource management, because of their importance to the country's macroeconomic structure and development in the foreseeable future. NEMA, in order to help improve and evolve disaster management in the country, had developed several plans and guidelines, one of which includes the development of the 2019 National Disaster Risk Management Policy, which is focused on areas like awareness, governance, capacity and resilience.

The Department of Climate Change engaged with NEMA on policy. Further work on DRR has been conducted in the context of the National Adaptation Plan Framework.

The Nigerian Meteorological Agency monitors weather variability and its influence on climate change. It prepares Seasonal Climate Prediction reports, the Drought and Flood Monitoring Bulletin, and the Decadal Agrometeorological Bulletin as early warning tools for citizens and planning tools for policy and decision makers in all sectors of economy.

The impacts of climate change in Nigeria vary in extent, severity and intensity. In the absence of in-depth quantitative research, the economic costs can only be approximated. The following summary shows what is at risk:<sup>i</sup>

**Overall Economy:** According to a 2009 DFID study, if no adaptation action is taken, between 2-11% of Nigeria's GDP could be lost by 2020. In this regard, climate change poses a significant threat to the achievement of development goals, especially those related to eliminating poverty and hunger and promoting environmental sustainability.

**Agriculture and Food Security:** Agriculture is one of the sectors most sensitive to climate change. Under a business-as-usual scenario, agricultural productivity could decline between 10 to 25 per cent by 2080. In some parts of the north, the decline in yield in rain fed agriculture could be as much as 50 percent. This in turn would impact GDP, reducing it by as much as 4.5 percent by 2050,<sup>ii</sup> even though the share of agriculture in GDP will decline from 40 to just 15 percent. Furthermore, in the absence of mitigating measures, the net import of yams and other vegetables is expected to decrease in the long-term. The net import of rice, however, is expected to increase by as much as 40 percent.

**Water:** A considerable proportion of the population is at risk of water stress, with less than 40% having direct access to potable water. Climate change brings increased variability in rainfall, resulting in flooding in some humid areas in the south in the country and a decrease in precipitation in the savannah north. This may result in droughts and decrease in surface water resources in the north. It is possible that changes in surface runoff and groundwater flows in shallow aquifers can be linked to climate variability with long-term implications for permanent and seasonal water bodies. The rapid shrinking of Lake Chad from about 45,000 km<sup>2</sup> in 1960 to less than 3,000 km<sup>2</sup> in 2007 is mainly attributed to changes in the climatic conditions in the region. Hydro-electric power generation suffers frequently from low in-flow into the dams and

<sup>2</sup> Department for International Development [DFID] 2009, p. 41

<sup>3</sup> Amangabara, G. T., & Obenade, M. (2015). Flood vulnerability assessment of Niger Delta States relative to 2012 flood disaster in Nigeria. American Journal of Environmental Protection, 3(3), 76–83

<sup>4</sup> 2013 Post Disaster Needs Assessment accessible at

[https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/assessments/23052013\\_nga\\_post\\_disaster\\_needs\\_assessment\\_2012\\_floods.pdf](https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/assessments/23052013_nga_post_disaster_needs_assessment_2012_floods.pdf)

water transportation along inland channels has also been negatively impacted. (Federal Ministry of Environment, 2010).

**Floods and Droughts:** Climate change would result in increased variability in rainfall, predictably resulting in floods in many parts of the country, particularly the humid areas, with devastating consequences. Single extreme climate events have the potential to wipe out years of development. For example, the total value of destroyed physical and durable assets caused by the 2012 floods has been estimated to be ₦1.48 trillion (US\$9.5 billion) or about 2% of the rebased GDP of US\$510 billion.

While floods may further ravage the humid areas to the south, a decrease in precipitation is expected in the savannah north. This may result in increased drought frequency and decrease in surface water resources, thus increasing its dependence on underground water sources. The increasing aridity in the northeast of the country has drastically reduced opportunities for sustainable agriculture and is considered a contributing factor to the current conflict and high degree of insecurity in the region.

**Soil Erosion:** Climate change-related heavier and steadier than normal rainfall that is expected in the southern part of the country will worsen soil erosion that is already of catastrophic condition in the sub-region. Recent increase in the number of reported severe landslides in south eastern States of the country is an attestation to the possible climate change-induced changes in erosion intensity.

**Sea Level Rise:** Nigeria's coastline is already undergoing pronounced morphological changes as a result of natural extreme events, such as sea surges and tidal waves. Global warming-induced accelerated sea level rise (ASLR), anticipated to be 0.5 - 1m this century, would exacerbate the poor condition of the country's coastline. With specific reference to the Niger Delta, it is estimated that with an ASLR of about 0.5m, about 35% of the highly-productive delta could be lost. With ASLR of about 1.0 m by 2100 (French et.al., 1995) about 75% of the delta could be lost.

**Energy:** Climate change will have significant effects on the energy sector in Nigeria. In particular, rising temperatures would result in increased energy demand for air conditioning, refrigeration and other household uses. This in a context of severe shortages of energy supply.

**Tourism:** Tourism, one of Nigeria's fastest growing industries, could be negatively affected as many tourist attractions are located along the coastal zone of the country. Traditional festivals (e.g. the Argungu River festival in Kebbi State) attracting many tourists may be impacted by reduced river flow.

**Ecosystems:** Forests and other ecosystems, already under significant pressure, would be adversely affected by climate change. Persistent flooding and water logging could make coastal forest regeneration more difficult. On the other extreme, the savannah biome of northern Nigeria would be very vulnerable to a reduction in rainfall in the region. This could result in degradation of habitats and the intensification of desertification.

## 4.2 The overall framework

Nigeria's response to this challenge is outlined in the National Adaptation Plan Framework<sup>5</sup>, which was published in June 2020. In fulfilment of the request contained in Decision 9/CMA.1, Nigeria has initiated preparation of its Adaptation Communication, which shall be submitted by 2022.

It provides a framework for the country to guide it in developing, coordinating, and implementing the various policies, plans, strategies, and legislation that will enable it to address its adaptation needs. Specifically, the objectives of the NAP Framework are to:

Clarify the country's approach to its NAP process. This includes articulating the country's vision of climate change adaptation, its adaptation objectives, the principles that will guide adaptation actions, roles and responsibilities among relevant stakeholders. It is also a reference point for bringing together various adaptation planning efforts from different sectors and scales of decision making (i.e., national, states, and local governments).

<sup>5</sup> <https://napglobalnetwork.org/wp-content/uploads/2020/06/napgn-en-2020-Nigeria-National-Adaptation-Plan-Framework.pdf>

Align the NAP process with existing policies (e.g., Economic Recovery & Growth Plan [ERGP], NASPA-CCN, National Climate Change Policy Response and Strategy [NCCPRS]), strategies, and adaptation research.

Focus on specific themes that are particularly relevant and/or unique to Nigeria's context.

The framework underscores the significance of the sectoral approach to development. It proposes an institutional arrangement that follows the broader climate change governance in the country, with the Department of Climate Change as the institution that will coordinate implementation of the plan.

## 4.3 Nigeria's vulnerability to climate change

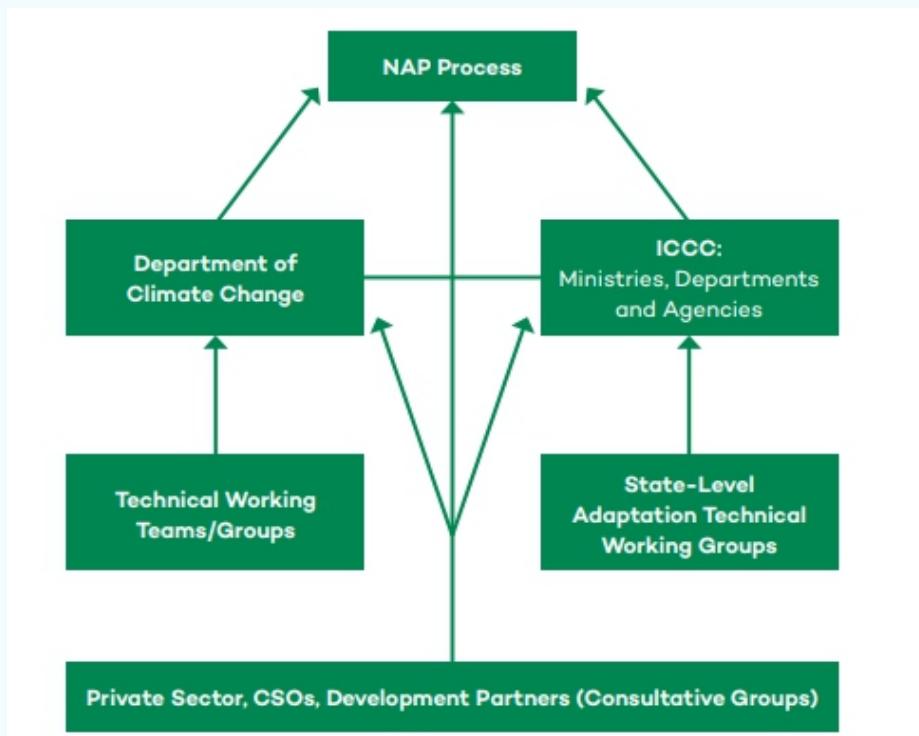
As outlined in the NAP framework and the background section above, the impacts in Nigeria of a changing climate include loss of life and properties, damages to socioeconomic infrastructures and ecological systems, exacerbation of communal conflicts as biodiversity resources, including freshwater, become scarce (especially in marginal areas of the country) and significant threats to the country's food security.

Climate change impacts tend to be moderated by socio-economic development of communities. Put differently, with increasing wealth, communities find they are more able to invest and adapt, to the extent that adaptation is still possible. So, Nigeria's rather weak socio-economic development is heightening the severity of the impacts, further limiting the country's capacity to respond to emerging challenges. Without serious interventions – including adaptation – the impacts of climate change could be even greater over time. This makes it crucial for Nigeria to firmly focus on those activities and programs that would strengthen its resilience and adaptive capacity in terms of socio-economic development and effective management of ecosystems.

## 4.4 The NAP processes

One of the key elements of the NAP process going forward will be to strengthen engagement with all MDAs. This is much needed, as climate change will impact on every sector of the economy – all MDAs therefore need to be part of the solution. This will be done via an Inter-Ministerial Committee on Climate Change (ICCC), which oversees interagency coordination on climate change. Many MDAs already have climate change desk officers and DCC regularly engages with states and local governments on climate change issues. A diagram of the institutional arrangements for the NAP process, taken from the NAP framework, is shown in Figure 3 below.

Figure 3: Institutional arrangement for Nigeria's NAP process



The Technical Working Group will be made up of experts working on adaptation issues and international processes to support the steering committee. At the bottom of the diagram there are three consultative groups, covering the private sector, civil society and development partners.

Progress in implementing adaptation objectives will be monitored and evaluated. The M&E component of the NAP process will include:

- Tracking the implementation of the various response measures included in climate change adaptation programs and activities.
- Providing an assessment of the effectiveness of the programs and activities.
- Evaluating the results and strategizing for improved performances.
- Improving coordination of climate change response measures.
- Publishing and communicating the assessment. • Ensuring transparency on financial flows relating to climate responses.
- Increasing awareness of observed and projected climate impacts.

Substantial financial resources will be needed to support the various aspects of the NAP process in Nigeria, not least due to the sheer size of the country and the diversity of ecological and social systems, which require variable adaptation strategies. Funding will come from three main sources – domestic budget allocation (from the federal (and possibly) state governments), international support (both bilateral and multilateral) and private sector funding.

Next steps for the NAP process are as follows:

- Initiating and launching the NAP process
- Setting up relevant committees
- A stocktaking exercise on what has already been done on adaptation in Nigeria
- Creation of an enabling environment for effective institutional functioning
- Addressing capacity gaps and weaknesses at the sector and state levels
- Assessing climate vulnerabilities at the sector, sub-national, and national levels
- Creation of a virtual knowledge platform for knowledge sharing among stakeholders
- Strengthening financing of adaptation action

More details on the NAP process can be found in the [NAP framework](#) published in June 2020.

## 4.5 The role of nature-based solutions

New analysis was carried out for the NDC update on the potential role for nature-based solutions (NBS). These are actions that protect biodiversity, sustainably manage and/or restore ecosystems, while simultaneously contributing to the achievement of multiple sustainable development goals, including national goals for climate, food security, water security, disaster risk reduction and livelihoods. Adding more details to the updated NDC on the role that nature-based solutions can play in delivering both mitigation and adaptation objectives in Nigeria, further strengthens the ambition already being shown. In 2020, the establishment of 10 additional national parks was approved, bringing the number of federal protected areas to 17.

The analysis concluded that Nigeria has an estimated mitigation potential of 115.52 Mt CO<sub>2</sub>e/year through selected nature-based solutions based on global data sets. The top three nature-based solutions for climate mitigation are agroforestry, improved forest management and forest restoration, with a combined mitigation potential of 89 Mt CO<sub>2</sub>e/year. This analysis does not include the potential contributions of regenerative agriculture, which could be enormous. Furthermore, implementing NBS in Nigeria can bolster water security by increasing the lifespan and efficiency of water supplies and enhancing the storage and recharge of groundwater (see Section 4.6). The NBS relevant to Nigeria can enhance food security by increasing availability of nutritious food to address Nigeria's high rates of child malnutrition (currently costing up to 11% of GDP), increasing resilience, and by reducing the environmental costs of agricultural production. Nigeria's natural disaster risks, particularly its high risk of coastal flooding, is addressed by NBS relating to mangrove restoration and management, which act as a buffer for coastal communities.

## 4.6 The water sector

Although some 70 percent of the population have a basic water supply, access is uneven and only an average nine litres of water is available to each Nigerian every day. In cities, 82% of people have a basic supply. In rural areas, only 54% do. In fact, only 19% of Nigeria's population has access to safe drinking water. According to UNICEF, 26.5 million or 29 per cent of Nigerian children experience high or extremely high-water vulnerability. Large areas see physical water scarcity risks overlap with poor water service levels. Communities living in these areas depend on surface water, unimproved sources of water, or water that can take more than 30 minutes to collect.

Yet, Nigeria on the whole has significant water resources, estimated at 333 billion m<sup>3</sup> of surface water and 88 billion m<sup>3</sup> groundwater resources, although with large-scale spatial inequalities in different regions of the country. The 2013 National Water Resources Master Plan evaluated water resources potential, created a demand projection, and made recommendations for policy implementation. In spite of this, Nigeria still faces the challenges of ensuring proper and sustainable management of its water resources for domestic, agricultural and industrial purposes. To achieve water security for every household, innovation, investment and collaboration is needed, ensuring services are sustainable and well-managed.

Against this background, climate change impacts could exacerbate the problem as it brings increased variability in rainfall. This would predictably result in floods in some humid areas to the south in the country and decrease in precipitation in the savanna north. This may result in the frequency and intensity of drought events and decrease surface water resources in the north, with negative consequences on the surface and groundwater systems of the region. Significant changes in surface runoffs and groundwater flows in shallow aquifers have been linked to climate variability, with implications for permanent and seasonal water bodies such as lakes and reservoirs.

**Box 1: Lake Chad**

To many observers, the story of Lake Chad is emblematic of the impacts of climate change. The lake is shared by Cameroon, Chad, Niger and Nigeria and as a result of over-use of the water, extended drought and the impacts of climate change, the surface area of the lake went from 26,000 square kilometers in 1963 to less than 1,500 square kilometers today. But the story is not without its contradictions: While temperatures in the region are rising one and a half times faster than the global average, Lake Chad's (reduced) size has since the 1990s, on average, been stable. At the same time, without a doubt, the unpredictability brought by climate change is worsening the political and economic conditions that have given rise to extremist violence affecting the region. Nigeria is working with the international community and neighbouring states to restore ecosystems and bring security to the region.

Improved water sanitation and supply is important for increasing Nigeria's resilience to shocks, whether to the direct impact of extreme weather events such as flooding or drought, or to the longer-term economic impacts occurring for shifts in the local climate. Improved water supply and sanitation is important to maintaining positive health outcomes in the community, increases opportunities for local economic activity, reduces impacts on ecosystems, and helps to build local livelihoods.

In addition to the general measures mentioned in NASPA-CCN and adopted in the NDC, a number of measures have been proposed that should foster a climate-resilient water sector in Nigeria by responding effectively to either too little or too much water that is characteristic of expected future climate risks. Some examples of these include:

- Adopt integrated water resources management (IWRM) approach for the sustainable development of the country's river basins.
- Protect and restore degraded watersheds and wetlands to protect water resources and related ecosystems services.
- Improve the quality of water-producing ecosystems that serve as sources of supply; including improving the conditions of sanitation services that may negatively impact on these ecosystems.
- Improve the resilience of water supply infrastructure.
- Increase investment in water supply and sanitation infrastructure, leading to improved access and uptake in urban and rural communities.
- Improve water demand management and services under increasing climate change and uncertain climate risks.
- Use economic instruments/incentives to promote climate change adaptation technologies that enhance water resources efficiency and climate-resilient water management in the country.

In terms of next steps, the implementation of the NDC will need to:

- Undertake detailed assessment of Nigeria's water sector vulnerability to climate change.
- Analyse national level cross-sectoral and within-sector explicit and implicit water commitments.
- Invest in design and management policies and systems for water-intensive energy infrastructure that enable energy system (e.g. solar) resilience.
- Integrate basin-level mechanisms to evaluate the robustness and flexibility of water commitments within and between catchments (possible inter-basin transfers) at national and regional (transboundary) levels.
- Introduce measures to monitor and manage water demands and to buffer increased unpredictability in water availability due to climate change.
- Promote NBS to climate change mitigation and adaptation in the water sector by enhancing integrated approach to the management of the country's freshwater ecosystems.
- Enforce sustainable and cooperative water allocation within and across basins at national and regional (transboundary) levels.
- Mobilise and align (involve) relevant actors (MDAs, civil society, private sector) supporting NDC implementation of the water sectoral plan.

Promote an enabling environment for NDC implementation in the water sector.

Mainstream NDC commitments for the water sector into national development priorities to attract sufficient private sector investment.

Improve the implementation of the national waste management strategy to reduce pollution of the country's water resources.

Increase coverage and quality of treatment of wastewater in municipalities to help protect water basins and sources, and other users dependent on the same source of water.

Implement national legislation and international commitments (e. g. Sendai Framework) by Nigeria that are related to the water sector.

Encourage a shift from a supply-side approach to a more sustainable, "demand-side" approach to water resource management.

Incorporate climate change effects into integrated water resources management.

Improve data collection, acquisition and management in the water sector.

Strengthen capacities of relevant institutions to implement water-related mitigation and adaptation measures.

Increase capacity building in activities and programs related to water and sanitation and their continued operation in the face of adverse effects from climate change.

## 5 Mitigation priorities

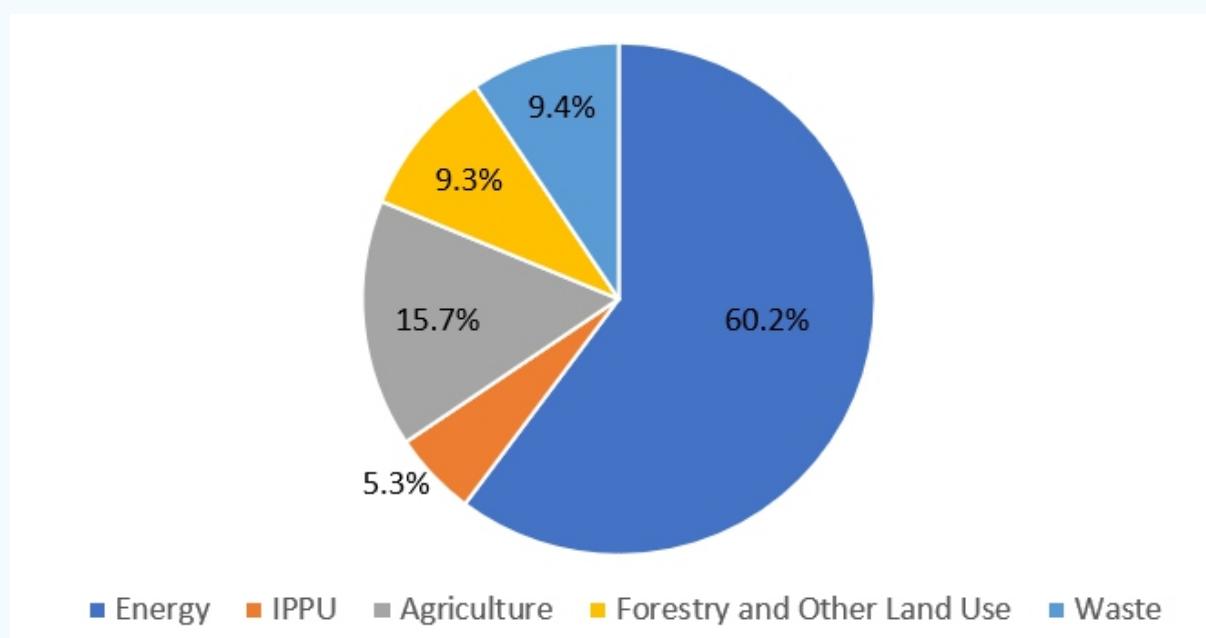
As outlined in the recently updated National Climate Change Policy (June 2021), Nigeria is committed to becoming a low-carbon economy as a means of promoting sustainable development as well as contributing to global efforts to reduce GHG emission. Nigeria's approach is to increase the availability of carbon sinks, whilst reducing the level of emissions released into the atmosphere, ideally in sectors such as energy generation, oil and gas, AFOLU, transport, mining and manufacturing (industry), which produce the greatest amounts of emissions in the country.

New mitigation analysis has been carried out to inform this updated NDC. More details can be found in the report titled 'Nigeria NDC update: Task 2 and 3 Report: Greenhouse gas and mitigation assessment'. Based on this analysis, Nigeria restates its commitment to its unconditional target to reduce GHG emissions by 20% below business-as-usual by 2030, and increases its conditional target to 47% below business-as-usual by 2030 on condition of receiving appropriate support (see Section 7 for more information on support needs).

### 5.1 Current GHG emissions

The new mitigation analysis estimated that GHG emissions in 2018 (the latest year for which estimates are available) were 347 MtCO<sub>2</sub>e. The energy sector was the largest source of GHG emissions with 209 MtCO<sub>2</sub>e emitted in 2018 (60% of the national total emissions). Fugitive emissions from oil and gas are the largest contributor to overall energy sector emissions (36% of total energy sector emissions in 2018), followed by transport, electricity generation (grid and off-grid), and residential and industrial energy consumption. Agriculture, Forestry and Other Land Use (AFOLU) is the second largest contributor to total GHG emissions, contributing approximately 25% of national total GHG emissions in 2018, following by waste (9%), and Industrial Processes and Other Product Use (IPPU) (5%).

Figure 4: Contribution to national total GHG emissions in Nigeria in 2018 (347 MtCO<sub>2</sub>e)

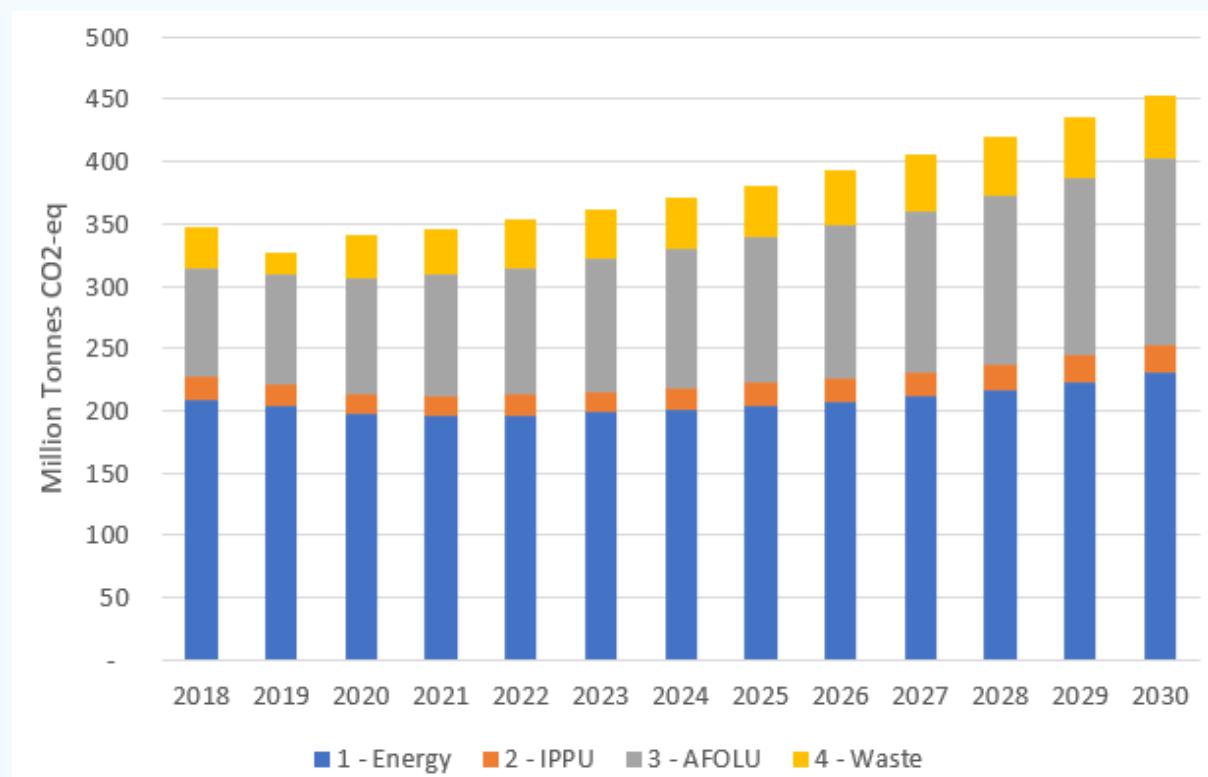


### 5.2 Baseline projections

The total GHG emissions in the baseline scenario are projected to 2030, in which an estimated 452.7 million tonnes CO<sub>2</sub>-equivalent emissions will be emitted (Figure 5). This represents a 31% increase in total GHG emissions between 2018 and 2030, or a 2.6% per year increase in total GHG emissions,

which is consistent with historic trends. Energy and Agriculture, Forestry and Other Land Use continue to be the largest single sources of GHG emissions in 2030, contributing 51% and 33% to total GHG emissions in 2030 respectively. As well as the increase in GHG emissions, SLCP's and air pollutants, such as black carbon and PM2.5, are also projected to increase to 2030 in the baseline scenario by 33% and 41% respectively. This increase in SLCP's will have implications for both climate and human health in Nigeria.

**Figure 5: Total GHG emission projections from 2018 to 2030 for the baseline scenario (Units: million tonnes CO<sub>2</sub>-equivalent emissions)**



These baseline projections of GHG emissions in Nigeria are sensitive to the assumptions regarding how activity in the different GHG-emitting source sectors will change into the future. The updated analysis considered lower and higher GDP growth assumptions. The results from this sensitivity analysis are, that compared to the 452.7 MtCO<sub>2</sub>e emitted in 2030 in the new baseline scenario (neutral GDP growth), the lower growth scenario results in GHG emissions in 2030 that are 13% lower than the main baseline projection shown in Figure 5, and the higher growth scenario results in 18% higher GHG emissions in 2030.

The projected baseline GHG emissions in 2030 are considerably lower than the 898 MtCO<sub>2</sub>e estimated in the INDC. There are three main reasons for the difference in baseline GHG emissions in 2030 between the 2015 INDC and this GHG mitigation assessment:

**Different historic estimates of GHG emissions:** Historic GHG emissions were estimated to be higher in the INDC compared to this GHG mitigation assessment. The main reason for this is due to the assumption of GHG sources and sinks from the Forestry and Other Land Use Sector, which were estimated to be higher in the 2015 INDC historical emission estimates (see 'Nigeria NDC update: Task 2 and 3 Report: Greenhouse gas and mitigation assessment' for further details<sup>6</sup>).

**Differences in assumptions about socio-economic development in Nigeria:** The INDC assumed that in Nigeria GDP would grow consistently at 5% per year. In the updated GHG mitigation assessment, GDP growth rates from the Economic Sustainability Plan have been

<sup>6</sup> Ibid.

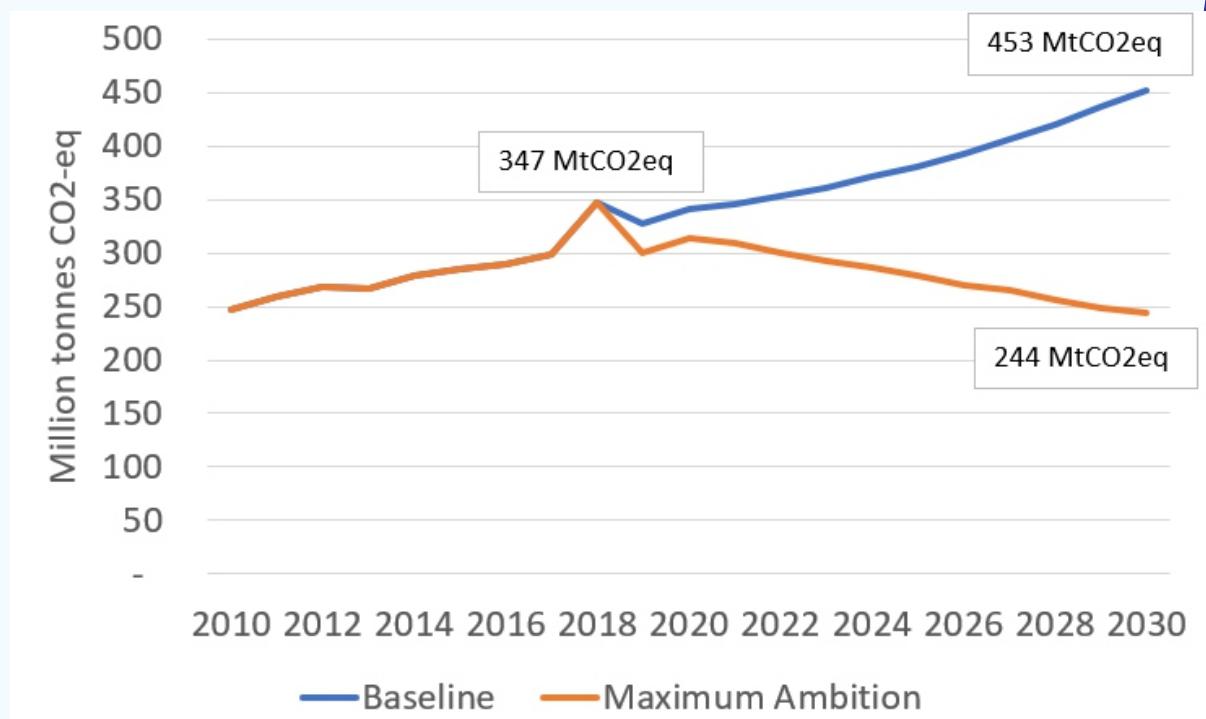
used and applied to project GHG emissions into the future. These GDP growth rates from the Economic Sustainability Plan are substantially lower than 5% per year, and account for the impact of the COVID-19 pandemic, and the expected economic recovery.

**Time period over which growth rates are applied:** In addition to the lower economic growth rates used in this updated GHG mitigation assessment, the period for which projections are made is also smaller. In the 2015 INDC, the 5% per year growth rates are applied from 2015 to 2030, i.e., 15 years. In contrast, in this updated GHG mitigation assessment, projections are made from 2019 to 2030, i.e., only 11 years. The longer period for which 5% per year economic growth is assumed compounds the differences in total GHG emissions in the baseline scenarios in the 2015 INDC compared to this updated GHG mitigation assessment.

## 5.3 The mitigation contribution

Despite baseline GHG emissions in 2030 being forecast to be considerably lower than previously estimated, Nigeria remains fully committed to the unconditional target set out in the INDC, to reduce GHG emissions in 2030 by 20% below business-as-usual emissions, and increases its conditional target to 47% below business-as-usual emissions in 2030, on condition of appropriate support. This is an ambitious commitment and represents a significant enhancement, that will lead to much lower absolute emissions than previously forecast. It will require significant resource mobilisation to achieve this target in the next nine years.

Figure 6: GHG emissions in MtCO<sub>2</sub>e Nigeria under business-as-usual scenario (blue line) and conditional contribution (orange line)



## 5.4 Fairness and ambition

This NDC update represents a fair and ambitious contribution to the objectives of the Paris Agreement. The conditional contribution represents significant progression towards the draft 2050 vision of halving current GHG emissions, which is itself a stepping stone towards ultimate net zero GHG emissions as early as possible in the second half of the century, consistent with article 4(1) of the Paris Agreement. The scale of the emissions reductions – a reduction of around 100 MtCO<sub>2</sub>e from current levels for the conditional contribution – is consistent with the level of emissions reductions proposed for Nigeria by

the [Climate Equity Reference Calculator](#) to be on a global 1.5°C pathway. Mobilization of international support and private sector investment would enable Nigeria to peak GHG emissions peak this decade.

Historically, Nigeria has contributed very little to the stock of GHG emissions in the atmosphere leading to human-induced climate change. Nonetheless, with this updated NDC, the country is committing to playing its full part in delivering a solution. This includes significant additional measures to be taken in the oil and gas sector, detailed below.

## 5.5 Delivering the NDC targets

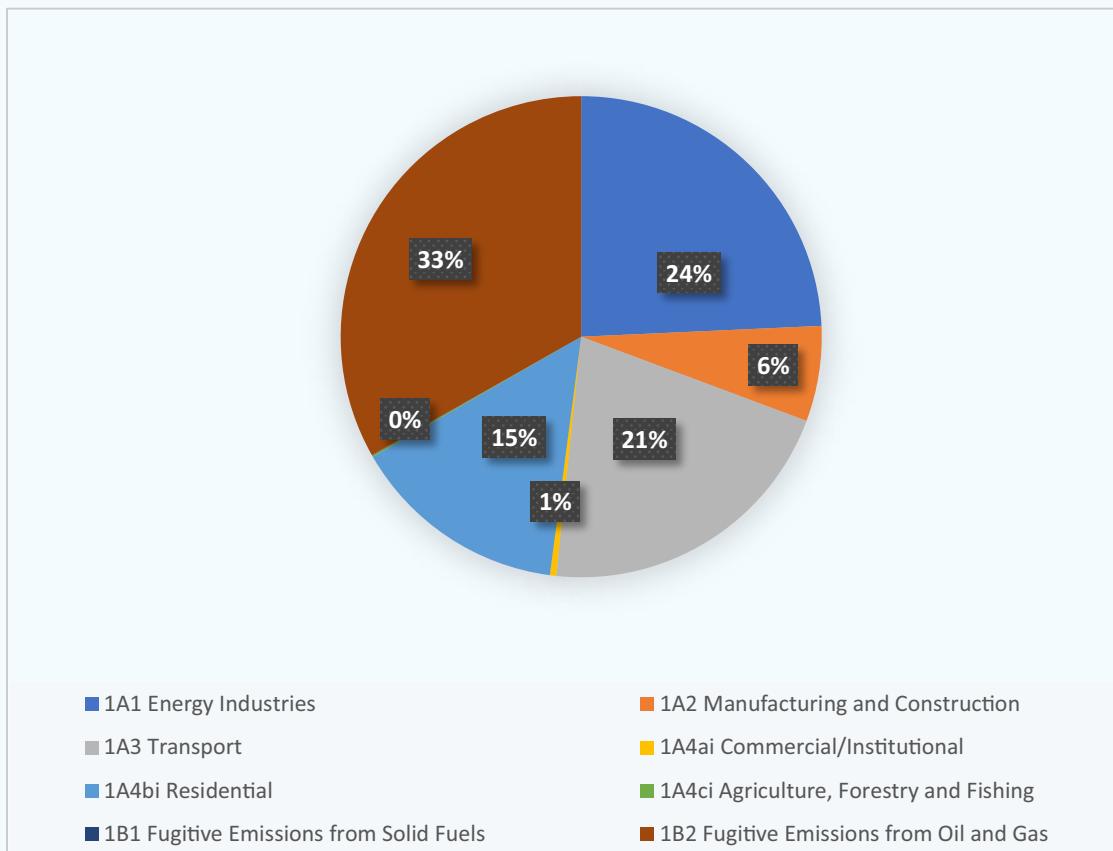
Delivering on these targets in just nine years will require significant action across all sectors, building on the work that the country has already done as outlined in Section 3. The sub-sections below give an overview of what needs to happen in each sector. The priority sectors – both in terms of the share of total GHG emissions and the number of planned mitigation measures – are the energy and AFOLU sectors.

### 5.5.1 Energy sector

How energy is generated and used in Nigeria is of huge importance. In 2018, the energy sector contributed to 60% of total GHG emissions and the sector also has an important role to play in delivering Nigeria's many development objectives. At the same time, it faces supply and distribution network constraints.

A partial privatization of the electricity sector was executed in 2013, with the aim of promoting efficiency, attracting private investment, and increasing generation. But the sector has struggled to deliver. The transmission and distribution system has failed to evacuate power from generating companies to industry. The tariff is not cost-reflective. As a result, the regional distribution companies struggle financially. The practice of estimated billing has made end-users further lose trust in the distributors. The erratic supply to end-users has led to a proliferation of diesel gensets. The cost of this to the economy is massive, as the situation has made Nigerian business less competitive. Recent developments are encouraging, with significant investments being made in transmission under the Presidential Power Initiative, the rise of renewable energy mini-grids, and a new service-based tariff that is cost-reflective for those customers with reliable service. The government believes that achievement of SDG 7 on energy access requires an investment in the commercial utilization of associated gas, previously flared, alongside a massive roll out of clean, renewable energy.

In 2018, emissions from the energy sector were 209 MtCO<sub>2</sub>e. Fugitive emissions from oil and gas were the largest contributor to overall energy sector emissions (36% of total energy sector emissions in 2018), followed by transport, electricity generation (grid and off-grid), residential and industrial energy consumption. The 2018 data is informed by an energy balance produced by IRENA. This work not only provided improved estimates of energy use but also made recommendations on how to make further improvements in future.

Figure 7: GHG emissions (MtCO<sub>2</sub>e) in 2018 in the energy sector in Nigeria

A range of measures will be needed to deliver the NDC targets in the energy sector.

Table 1: Mitigation measures in the energy sector (conditional)

Sector	Measure
Residential	48 % of population (26.8 million households) using LPG and 13 % (7.3 million households) using improved cookstoves by 2030
Energy efficiency	Elimination of kerosene lighting by 2030 2.5% per year reduction in energy intensity across all sectors
Transport	100,000 extra buses by 2030 Bus Rapid Transport (BRT) will account for 22.1 % of passenger-km by 2035 25 % of trucks and buses using CNG by 2030 All vehicles meet EURO III emission limits by 2023 and EURO IV by 2030
Electricity generation	30 % of on-grid electricity from renewables (12 GW additional large hydro, 3.5 GW small hydro, 6.5 GW Solar PV, 3.2 GW wind) 13 GW off grid renewable energy (i.e., mini-grids 5.3 GW, Solar Home Systems and street lights 2.7 GW, self-generation 5 GW) Reduce grid transmission and distribution losses to 8% of final consumption of electricity in 2030, down from 15% in 2018. 100% of diesel and single cycle steam turbines replaced with combined cycle Elimination of diesel and gasoline generators for electricity generation by 2030
Oil and gas	Zero gas flaring by 2030 60% reduction in fugitive methane emissions by 2031

A number of so-called co-benefits will arise from implementation of energy sector mitigation measures. These include:

- Gender – for example, improved access by females to decent and efficient transport.
- Just transition – for example, creation of green jobs in the installation and servicing of the improved cook stoves.
- Health – for example, improved air quality from clean transport measures and from reduced reliance on firewood and charcoal in homes.

### **Box 2: Energy access developments since 2015**

Alongside large investments in the on-grid subsector, the government through the Rural Electrification Agency (REA) and Renewable Energy Fund (REF) is promoting access to clean energy for all, in particular promoting the establishment of mini-grids and solar home systems.

The five-year Nigeria Electrification Project (NEP), funded by the World Bank and African Development Bank through the REA, has allocated USD 550 million, dedicated to mini-grid and solar PV systems deployments.<sup>7</sup> REA recently launched the Solar Power Naija Program, aimed at providing mini-grid developers and solar systems distributors up to NGN 140 billion loan from the Central Bank of Nigeria Solar Intervention Fund under the Economic Sustainability Plan. It is aimed at achieving 5 million solar PV connections, serving 25 million Nigerians and creating 250,000 green jobs.<sup>8</sup>

In the off-grid sector, the investment estimates for standalone solar PV systems range from USD 1.5 billion identified gap over the next five years<sup>9</sup> to USD 12 billion per year if substituting solar for small gensets.<sup>10</sup> For mini-grids, investment opportunity is estimated at approximately USD 30 billion.<sup>11</sup>

### **Box 3: Clean cooking**

As set out in Table 1 above, under the updated NDC, the Federal Government of Nigeria aims to implement a programme to convert over 25 million households to using LPG. Traditional cooking with firewood is claiming lives, ravaging forests, undermining the empowerment of women and emitting millions of tons of greenhouse gases to the atmosphere. Conversely, clean cooking fuels such as LPG and low cost improvements in the efficiency of cooking energy devices provide a pathway to make the poor part of the climate solution. As an example, it is expected that under a business-as-usual situation, 97,000 lives could be lost by 2030 due to poor air quality in the home from dirty cooking fuels. By taking the steps outlined above to encourage cleaner cooking, 30,000 premature deaths could be avoided by 2030, in addition to the significant carbon savings.

#### **5.5.2 Agriculture, forestry and land use**

Agriculture, Forestry and Other Land Use (AFOLU) is the second largest contributor to total GHG emissions, contributing approximately 25% of national total GHG emissions in 2018. As well as being the second largest source of GHG emissions in Nigeria, the AFOLU sector is also hugely important for climate adaptation. For example, more information on the important role of nature-based solutions in adaptation can be found in Section 4.5.

<sup>7</sup> <https://rea.gov.ng/nigeria-electrification-project-nep/>

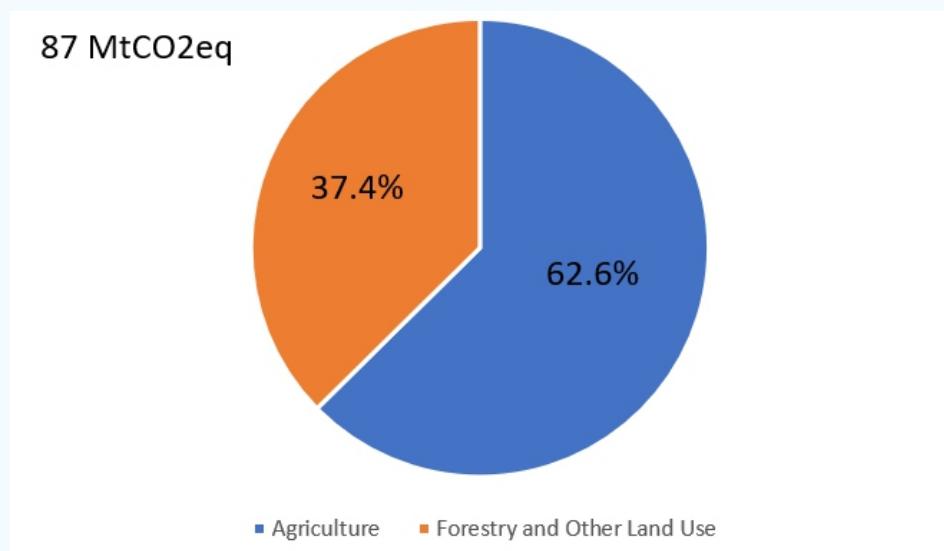
<sup>8</sup> <https://rea.gov.ng/solar-power-naija/>

<sup>9</sup> 2021, [ACE-TAF, Stand Alone Solar Market Update Nigeria.pdf](#)

<sup>10</sup> 2019, [Dalberg, Putting an End to Nigeria's Generator Crisis: The Path Forward](#)

<sup>11</sup> 2020, [MGP, Bloomberg NEF, SE4All, State of the Global Mini-grids Market Report](#)

Figure 8: AFOLU emissions by sub-sector (2018)



Furthermore, the AFOLU sector will continue to be critical in the move to a low carbon and climate resilient country. Under business-as-usual projections it is estimated that GHG emissions from the AFOLU sector will grow to be 33% of total emissions in 2030.

Nigeria has a REDD+ Strategy to implement the forest sector plan in order to achieve NDC targets through and draw on the AFOLU potential for abatement. These are in addition to the efforts to plant 12 million trees, and address energy gaps and include building capacity of local communities in improving forest management, promoting good governance, ensuring equitable access and distribution forest resources to all affected parties, including women, youths and other vulnerable groups and accessing finance to realise these objectives through partnerships.

A range of measures will be needed to deliver the NDC targets in the AFOLU sector.

Table 2: Mitigation measures in the AFOLU sector

Sector	Measure
Agriculture	Climate smart agriculture – a range of measures taken forward as an integrated approach to managing landscapes (e.g. cropland, livestock, forests and fisheries)
	50 % of cultivated land adopts intermittent aeration of rice paddy fields
	A 50 % reduction in fraction of crop residues burnt by 2030
Forestry and Other Land Use	Improved natural forest management (128,528 ha of natural forests in the southern belt and southwest quadrant of the country)
	Forest restoration (115,584 ha of degraded forest area across the states in the southern belt, southwest quadrant and in states located in the savanna ecological zone of the country)
	Increased forest protection (46,219 ha of forest throughout the country)
	Reduced fuelwood harvest (Reduce the area of forestland used for fuelwood harvesting by 19,346 ha)
	Protection and restoration of mangrove forest ecosystems (13,012 ha of mangrove ecosystems across all the coastal states in the Niger Delta)

For **agriculture**, Climate Smart Agriculture (CSA) is a key mitigation measure. Its aims are to sustainably increase agricultural productivity and support equitable increases in farm incomes, enhancing food security and development. The sector exhibits high growth and is deemed essential for the creation of youth employment. Farmers take agro-ecological measures that increase the resilience of the farming systems, as opposed to measures that promote high external input farming, industrial meat production and large-scale industrial agriculture, which contribute to climate change. The benefits of improved practices go beyond improved yields. With improved yields come improved diets, growing productivity and reinvestment in rural communities. One example is agroforestry, where trees are mixed with crops and animals on the same land, can be another option for carbon fixing and for providing mulch material. Estimates of the benefits from agroforestry range from total (lifetime) emissions reductions of 158 million tonnes to 712 million tonnes. Another example is a reduction of methane emissions from livestock, through improved feeding and breeding.

The **forest sector** has historically been important to the Nigerian economy as a major contributor to national GDP. The sector provided employment for a large number of people and contributed two-thirds of GDP in the 1970s, before this contribution declined significantly over the past decades to about 2% of GDP.

However, with the immense threat that climate change poses for Nigeria's highly natural capital-dependent economy, the forest sector holds real potential for a much greater contribution to the country's economy, its NDC, as well as its green growth and sustainable development agenda. Nigeria has, therefore, embarked on reforming and improving its forest management practices, seeking to end illegal firewood harvesting, placing a focus on promoting efficient use of forest resources and more deliberately supporting the sustainable development. The growth trajectory of the forest sector is characterised by intensive afforestation, as for example, intended in the First National Implementation Plan (FNIP) of the country's Vision 2020, and driven by growing green investment in stopping forest loss, recovering deforested areas and expanding forest cover in the country through its REDD+ and green economy approach. The planned initiatives should ensure that forests are protected and sustainably managed, and forest ecosystem services are properly valued and paid for.

#### Box 4: The contribution of the forest sector to the NDC targets

Nigeria's FREL estimates for 2016 indicate that the forest sector (excluding agriculture and other land uses) contributed approximately 32 million tCO<sub>2</sub>-eq. Forest cover loss per year is 63,359 hectares per annum.

In terms of monitoring and MRV, Nigeria is currently in the process of developing its national forest monitoring system that will be responsive to local circumstances and improve the existing systems. Community monitoring aspects will involve women and youth. The objective is to ensure the generation of data that would be “transparent, consistent over time, and suitable for measuring, reporting and verifying, taking into account national capabilities and capacities”.

### 5.5.3 Waste

The waste sector contributed to 9% of total GHG emissions in 2018, with waste emissions expected to grow by 2030 under the business-as-usual scenario, in response to increasing population and economic growth. GHG emissions from the waste sector result largely from disposal of solid wastes through landfilling, dumping, incineration, open burning and treatment of domestic and industrial liquid wastes.<sup>12</sup>

The priority mitigation measure in the waste sector is a 10% reduction in methane emissions from organic solid waste through diversion to composting.

There are a number of other actions that can be taken to support mitigation action in the waste sector:

- Increasing legislation enforcement by strengthening/expanding the relevant institutions, such as NESREA
- Increasing waste-to-wealth schemes nationwide which creates jobs and reduces landfills, including through implementation of the Extended Producer Responsibility scheme.
- Creating new waste management PPPs to convert organic and agricultural waste into animal feed and available all year in Northern Nigeria where livestock rearing is common.
- Revising or revamping waste management projects that have already been established by the federal government, in order to help meet the 10% emission reduction target.

A key element of Nigeria's approach to the waste sector is a move to a more circular economy. The Circular Economy (CE) is a strategy that propels a society towards generating no waste, as all materials are maximally utilized in cyclic processes. It is intentionally designed and implemented to be incorporated in the production systems elongating the lifecycle of materials and phasing out the concept of ‘waste’ and this, in turn, leads to a reduction in GHG emissions and their impact on climate change.

A study was carried out in 2021 to inform the NDC update, looking at the impact of the CE in the waste management sector of Nigeria. The outcome of the review of the CE policy and institutional landscape showed that the Nigerian legislation related to waste management had embedded circular economy procedures in policies such as the National Policy on Plastic Waste Management (2020) and National Policy on the Environment (2016). Out of the 33 national environmental regulations being implemented by NESREA, excluding the Nigerian Constitution, 27 of them are waste related with 23 of these having circular economy features. The levels of circularity differ between sectors, for example presently 10% for the food and beverages sector, rising to 30% by 2025, but much higher (80%) currently for batteries. However also of relevance is the quality of the recycling facilities. For example, most of the recycling of battery waste is done in ‘dirty’ recyclers that pollute the local environment. Hence it can be seen that whilst the overall waste management legislative framework in Nigeria is supportive of CE aims, there is still much that can be done to improve both the level and quality of circularity. Importantly, the study showed that significant reduction in emissions from the waste sector can be achieved between 2023 and 2030 if Nigeria achieves a recycling rate of at least 7.47%.

<sup>12</sup> Third National Communication page 118 -

[https://unfccc.int/sites/default/files/resource/NIGERIA\\_NC3\\_18Apr2020\\_FINAL.pdf](https://unfccc.int/sites/default/files/resource/NIGERIA_NC3_18Apr2020_FINAL.pdf)

#### 5.5.4 Industrial processes and product use

Whilst energy use in industry is covered in the energy sector, the IPPU sector includes GHG emissions from industrial processes, such as cement, iron and steel and ammonia production, GHG emissions from the IPPU sector were 5% of total GHG emissions in 2018.

The priority mitigation measure in the IPPU sector is to reduce HFC gases in line with the Kigali Amendment to the Montreal Protocol. This means a phase-down of hydrofluorocarbons (HFCs) by cutting their production and consumption. The goal is to achieve a more than 80% reduction in HFC consumption by 2047, in accordance with Nigeria's obligations under the Kigali Amendment.

#### 5.5.5 Short-Lived Climate Pollutants

Nigeria recognises the importance of taking action to reduce Short-Lived Climate Pollutants (SLCPs), like black carbon, methane and hydrofluorocarbons (HFCs), alongside GHGs. Nigeria acknowledges the IPCC 2018 Report on Global Warming of 1.5 degrees, which showed that there was no pathway to limiting global warming to 1.5 degrees without strong reductions in SLCPs, as well as GHGs. In 2015, Nigeria was one of few countries to highlight its commitment to reduce SLCPs, and has built on this commitment since the submission of its 2015 NDC. Nigeria is the largest market for cooling in Africa and one of the fastest growing in the world. With support from the Kigali Cooling Energy Programme (K-CEP) Nigeria promotes the transition to energy-efficient air conditioning using low-GWP natural refrigerants in residential, commercial and public buildings. This will be done through a project called "Scaling Up Energy-Efficient and Climate-Friendly Cooling in Nigeria's NDC Revision" with the goal to accelerate the transition to climate-friendly (low-GWP refrigerant) and energy-efficient AC in residential, commercial and public buildings. Project outcomes are envisaged as follows:

- Technical support to incorporate new targets for cooling efficiency in the revised NDC
- AC Minimum Performance Standards and labels revised, with plans in place for adequate future monitoring, verification and enforcement.
- Reduction in indirect greenhouse gas emissions via reduced electricity consumption and the related GHG emissions from fossil fuel combustion at power plants.
- Reduction in direct greenhouse gas emissions by accelerating the transition to lower GWP refrigerants. Noting legacy refrigerants destroy the ozone layer and accelerate global climate change.
- A National Cooling Plan chapter on building space cooling will be developed.

In 2019, the Federal Executive Council endorsed [Nigeria's National Action Plan to reduce SLCPs](#). This National Action Plan includes 22 specific actions that would substantially reduce SLCPs. As part of this NDC update, many of these actions have been integrated into the sectoral mitigation measures highlighted in Sections 5.5.1-5.5.4, and the reductions in SLCP (and air pollutant) emissions from achieving the NDC targets have been evaluated. In terms of SLCP reductions, the full achievement of Nigeria's NDC is estimated to reduce black carbon, methane and hydrofluorocarbon emissions by 42%, 28%, and 2% respectively, in 2030 compared to a baseline scenario. Other health-damaging air pollutants such as particulate matter (PM<sub>2.5</sub>) and nitrogen oxides (NO<sub>x</sub>) would also be reduced by 35% and 65%, respectively. Hence the implementation of Nigeria's NDC would result in substantial local benefits for human health through reduced air pollution exposure, in addition to its climate change mitigation benefits.

## 6 Cross-cutting issues

Delivery of the adaptation and mitigation priorities outline above can be supported and guided by a number of cross-cutting issues.

### 6.1 Gender inclusion

The measures included in the Nigeria 2015 NDC and this 2021 update were deemed to at a minimum be gender neutral and / or to enhance social inclusion.

As stated in the 2015 NDC, the degree to which people are affected by climate change impacts is influenced by their social status, gender, wealth, political power and access to and control over resources. women and youth, but also remote communities, still have less economic, political and legal clout than, for example, men and the urban middle class. They are more directly impacted and less able to cope with climate impacts. At the same time, mitigation measures can empower these groups that are socio-economically disadvantaged in a differentiated manner.

An example is the poverty penalty paid by households in search of potable water and fuel wood. Women benefit most from clean efficient cook stoves, gaining in health and in productive time where these are introduced. They, however, have difficulty accessing financial institutions. Similarly, agricultural extension services have proven to reach more men than women. New policies and measures need to be assessed against their ability to bring social inclusion and be culturally appropriate, as well as improve livelihood security, increase resilience and reduce emissions.

Improving gender equality has been a long-standing priority for Nigeria. Nigeria ratified the Convention on Elimination of All Forms of Discrimination Against Women in 1984 and the Maputo Protocol on the Rights of Women in Africa in 2004, with its first national gender policy being adopted in 2000. Despite women being disproportionately affected by climate change, they play a crucial role in climate change adaptation and mitigation. So, in 2020 the Federal Government published its National Action Plan on Gender and Climate Change for Nigeria. The goal of the Plan is to ensure that national climate change processes in Nigeria mainstream gender considerations to guarantee inclusivity of all demographics in the formulation and implementation of climate change initiatives, programs and policies. It focuses on five key priority sectors – agriculture, forestry and land use, food security and health, energy and transportation, waste management, water and sanitation. Examples of the kinds of actions included in the Plan to 2025 include:

#### Agriculture, forestry and land use

- o Conduct capacity development trainings for federal and states institutions on gender mainstreaming in policies and programmes.
- o Provision of agro-processing and storage facilities to smallholder farmers groups, especially women.
- o The 2019 National Gender Policy in Agriculture is a sectoral gender mainstreaming strategy document that seeks to complement existing policies in the agricultural sector. It is important to note that women are responsible for carrying out 70 per cent of agricultural labour, 50 per cent of animal husbandry related activities and 60 per cent of food processing activities. yet they presently only have access to fewer than 20 per cent of available agricultural resources.
- o As programmes related to the forest sector are developed on the ground, consultations should be held to integrate a gender and social inclusion approach. At a minimum, during the planning phases, consultations can document how many women and men participated and specify types of stakeholder groups consulted and involved such as the Ministry of Women's Affairs and Social Development and non-state stakeholders such as women's and/or youth groups.

#### Food security and health

- o Train women community nurses to address climate change related diseases.
- o Conduct capacity building on integrating climate change and gender issues in the health sector for health sector agencies.

#### Energy and transportation

- o Develop and introduce affordable clean cooking options to especially rural communities and schools.
- o Conduct practical trainings for women on the construction of wood efficient stoves and small biogas stoves.

#### Waste management

- o Build capacity of educational institutions (Primary, Secondary, University) on waste management.
- o Provide access to loans and microcredits for women to engage in small-scale waste management projects.

#### Water and sanitation

- o Train women in plumbing, water plant treatment, community-based quality monitoring system and service provisions at state and rural levels.
- o Mobilise women groups to establish nurseries and plant trees upstream to avoid dislodgement of sediments, soil erosion and improve water quality.

In preparing the 2021 NDC update, a detailed gender analysis was conducted to determine gender differences in contributions to national development, division of labour, employment, access to resources, and participation in decision-making in the seven priority sectors of the NDC. The analysis revealed a general lack of access to and control of resources by women compared to men in all seven priority sectors. In addition, except for Agriculture and Rural Development, gender inclusion is still mostly lacking in sectoral policies. This highlights the need for policy review for gender mainstreaming, proper institutional coordination, provision of enough budgetary allocation for gender-related activities; building the capacities of women, revision of recruitment policies and a clear monitoring plan using verifiable gender indicators to ascertain the success or otherwise of any gender-related programme on the priority sectors. Once integrated, these recommendations will make the 2021 NDC update and the existing 2017 NDC Sectoral Action Plans gender-sensitive, thereby enhancing gender integration into the climate change policies and actions.

## 6.2 A whole of society approach

The process to update the NDC was a collaborative and inclusive one, involving a range of stakeholders. Obviously the COVID-19 pandemic provided an extra challenge and meant that in-person stakeholder workshops were not possible for much of the project. But like all countries, Nigeria has adapted its approach and carried out a greater level of engagement virtually. Since March 2020, the Federal Ministry of Environment, in close consultation with all relevant MDAs and other stakeholders, including the States, private sector, and civil society organisations, worked to prepare the update to the 2015 NDC. The process of NDC preparation was supported by UNDP and the NDC Partnership, with some 30 teams of mostly Nigerian experts contributing. Validation workshops were held for the endorsement of all technical work products used to inform the NDC update. This includes a number of regional workshops to enable engagement by the States. The draft NDC update itself has been subject to validation by relevant MDA Directors and for information elected representatives (NASS).

Key inputs to the update were the numerous projects run under the auspices of the NDC Partnership's Climate Action Enhancement Package (CAEP), as well as the UNDP's Climate Promise. A list showing some of the projects that fed into the NDC update is shown below in Table 3.

**Table 3: Select NDC Partnership CAEP projects that supported the NDC update**

Project	Implementing Partner	How it fed into the NDC update
Updating mitigation target for the electricity sector	GIZ	Fed into LEAP modelling
Off-grid electricity	GIZ	Fed into LEAP modelling
Forestry	UNDP	Fed into LEAP modelling
Refrigerant gases	UNDP	Fed into LEAP modelling

Long-term low-GHG vision	2050 Pathways Platform	Helped with alignment of updated NDC with long term vision
Nature-based solutions	UNDP	Measures added to NDC
NDC costing/I&FF	UNDP	Helped provide financial cost data for mitigation actions
Gender	UNDP	Helped with understanding gender impacts of different measures
Green jobs	UNDP/ILO/ SINTEF	Fed into analysis of economic impacts of the NDC targets
Water Sector	UNDP	Measures added to NDC
Inclusion of clean cooking solutions in Nigeria's NDC Revision	NDC Partnership Support Unit	Fed into LEAP modelling
Waste sector and circular economy	AfDB	Fed into LEAP modelling
Updated energy balance	IRENA	Used for base year in LEAP modelling
Enhanced private sector participation in climate action	AfDB	Increases private sector participation in NDC implementation

Each individual project had its own stakeholder engagement process. For example, in late 2020 and early 2021 the clean cooking project, funded by the NDC Partnership, held a series of online stakeholder workshops to discuss and validate the results of the work.

In addition, a stakeholder validation workshop was held in May 2021 to run through the outcomes of all the key projects and to discuss how they would be reflected in the updated NDC. The draft NDC was validated by Directors from all MDAs represented on the Inter-Ministerial Committee on Climate Change.

As Nigeria looks ahead, to the continuation of implementation of the NDC, further stakeholder engagement is envisaged, in particular ensuring that vulnerable groups and sub-national entities are given the opportunity to feed into the process.

## 6.3 Youth

Nigeria is committed to Article 6 of the Framework Convention and Article 12 of the Paris Agreement, seeking to empower citizens to engage in climate action, through education, training, public awareness, public participation, public access to information and international cooperation. Inter-generational equity is one of the Article 3 principles underpinning the UNFCCC.

It must be recalled that Nigeria is a ‘young’ country with a median age of 18.4 years. Young people represent a tremendous potential. However, in a context of economic slowdown, young adults are at a higher risk of unemployment or under-employment and poverty than the rest of the population. Providing access to education, especially vocational training is a government priority. In response to the pandemic, the government launched the largest job creation programme for youth in Nigerian history.

Youth have long been recognized as a catalyst in the process of NDC implementation. In 2020, a Youth Action Manual on climate change was developed in collaboration with the Nigerian Conservation Foundation as an accessible tool for youth taking climate action. It identifies opportunities for youth engagement in all NDC sectors and includes some tools on advocacy, communication, Monitoring and Evaluation, finance, and knowledge. In preparing the 2021 NDC update, several engagement meetings with representatives of youth groups were organized and 8 issue working groups established. Regional hubs have been established.

## 6.4 Sub-national action

Nigeria has a federal system of government, with three tiers of government – federal, state and local government. Vertical integration between these three tiers will be crucial in delivering on the ambitious targets set out in this NDC. It is therefore important that the Federal Government works closely with states and the local government areas, to coordinate climate action, support each other and to maximise positive synergies.

One example of where sub-national climate action is being taken forward is in Lagos State. In 2018, Lagos was one of nine African cities that committed to achieving zero carbon emissions by 2050. And in June 2021 Lagos unveiled its five-year action plan for the period 2020-2025.

### **Box 4: Lagos's five-year climate action plan, 2020-25**

The five-year plan aims to put Lagos on a pathway to zero carbon by 2050, enhance the climate resilience of the city and its population and to maximize the co-benefits of climate action, such as greener and healthier lifestyles. It was developed through a stakeholder engagement process, that allowed the plan to gain broad buy-in from business, civil society and the wider public. The plan envisages a range of actions to reduce GHG emissions in each section, including:

#### Transport

- o Expansion of the BRT network in Lagos.
- o Spatial planning to promote transit-oriented development.
- o Encourage the uptake of low-emission vehicles.
- o Encourage the shift of freight from road to rail.

#### Energy

- o Installing solar PV systems on all schools, hospitals and municipal buildings.
- o Reduce emissions in the residential sector by promoting the development of energy storage technologies and incentivizing the deployment of micro-grids in off-grid urban communities.

#### Waste

- o Divert organic waste from landfill by encouraging separation at source and introducing composting technologies.
- o Implement composting, waste-to-energy and other waste recovery initiatives in underserved communities.

It also foresees action to improve climate resilience, including:

- Improving, expanding and maintaining the city-wide drainage network.
- Planting more trees to provide shade and cooling in public spaces.
- Engaging in community-based participatory flood management.

The Federal Government will work with other States to help them take similar action, following the leadership example being set by Lagos.

## 6.5 Green jobs and a just transition

### 6.5.1 Green jobs

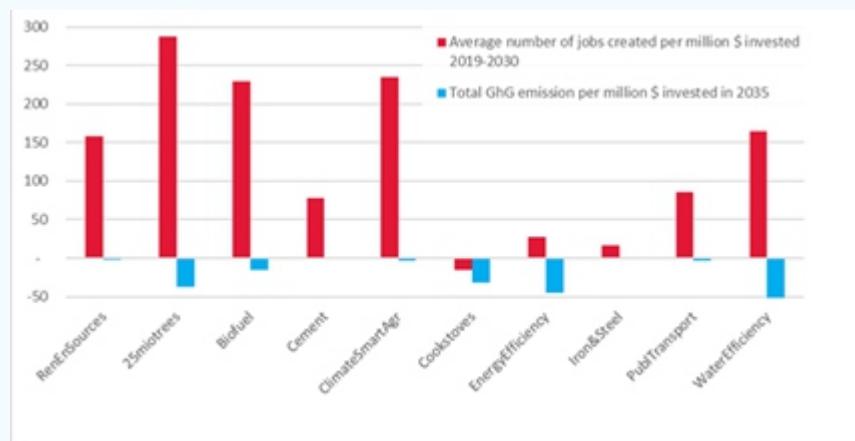
A key co-benefit from climate action will be the creation of green jobs. A study was completed in 2021 that evaluated the impact of Nigeria's climate policies on employment, GDP and emissions. This found that in terms of total number of jobs created, policies to increase power generation have the largest effect. Over the period 2020 up to 2035, on average, around 12 million net additional jobs will be added across the economy as compared to a baseline scenario. The significant increase in employment needs to be interpreted in light of the significant capital investments (USD 80 billion) which generates massive job opportunities in construction and installation in the short to medium term. In addition to the first short to medium term effect, secondly, it is imperative to consider the long-term structural change effects. Comparing the 11 policies studied in the report, there are significant differences in terms of size, but all have an overall positive employment and economic growth effect, which lasts beyond 2035.

Some policies have significant employment creation potential even without major investments. Such low hanging fruit policies exist in the agricultural sector. A policy that would incentivize climate smart agricultural production systems has the potential to add some 3 million net jobs across the economy. Policies in the industrial and transport sector are less ambitious and smaller in terms of investments as compared to the power sector policies. Resulting total employment in those sectors are therefore smaller and only mirror the less prominent climate plans.

The report also considered the cost effectiveness of green jobs potential from different mitigation measures. For example, comparing the Biofuel with the Cement policy reveals that both policies add a total of around 800,000 jobs to the economy. However, investments in the cement industry (USD 11.3 billion) are more than three times as costly compared to the requirements in the biofuel industry (USD 3.6 billion). This finding is important because it exposes that it is not only the total size of the investment that matters. But, that the type of investment is of crucial importance. Depending on what type of economic structural change is induced by the investment, more or less jobs, GDP and emission will result.

A climate-employment cost-benefit analysis allows a better understanding the relative employment creation potential of the NDC policies. Such analysis reveals the 'biggest bang for the buck' in terms of their job creation and emission reductions. It is the Agriculture, Forestry and Fishery sector, which results in the highest job multiplier. Economy wide, between 230 and 290 job opportunities are created per one million US dollars invested while reducing GHG emissions by up to 30 tons (such as through tree planting). The job multiplier in renewable energy is also comparatively high at around 150 jobs, however smaller than in Agriculture and Forestry and leading to only very small emission reductions due to the economic growth effect of renewables (see Figure 9).

**Figure 9: Total economy wide job and GHG multiplier per million US dollar invested<sup>13</sup>**



As well as the expected green jobs benefits, the report looked at the importance of a just transition and not leaving behind those working in certain higher-carbon sectors. For example, the firewood and charcoal sector involves some 41 million workers and provides an estimated 530,000 full time equivalent direct jobs. Some additional 200,000 workers, most often also full-time employment, provide transport services for retail and wholesale trade. Any measures that look to limit use of firewood will need to manage this transition carefully.

### 6.5.2 Just transition

But it should be noted that social and employment gains are not automatic. Climate policies have positive job outcomes only if accompanied by just economic, social and labour policies (Just Transition Policies). The Nigerian Government is committed to accompany the NDC with just transition policies and engaged in social dialogue, to maximise employment and economic growth while protecting potentially negatively impacted populations. It will support skills development for renewable energies, and high productive agriculture and forestry and agro-processing while ensuring social protection for

<sup>13</sup> Source: ILO-UNDP 2021: Nigeria Green Jobs Assessment Report: Measuring the Socioeconomic Impacts of Climate Policies to Guide NDC Enhancement and a Just Transition

the most vulnerable. In the implementation of the NDC, particular attention is given to the agricultural, forestry and fisheries sector to unlock its significant job creation, poverty and emission reduction potential. Integrating rights to decent work and environment justice is at the core of the interest of workers, both the government and unions believe that this can be best achieved when the process is inclusive and democratic. Skills development and retraining for enhancing job creation and provisions for a just transition will need to be integrated into the policies of line ministries.

As part of the just transition, it will be crucial for Nigeria to understand both the potential impacts of climate change on key stakeholder groups, such as the youth and vulnerable groups, whilst also considering what their role can be in delivering a low carbon and climate resilient economy.

## 6.6 MRV and transparency

In 2020 Nigeria submitted its [Third National Communication](#) to the UNFCCC, furthermore the first [Biennial Update Report](#) was published in 2018. Like all countries, Nigeria is currently preparing for the enhanced transparency framework (ETF) coming into effect in 2024. Whilst in some ways the ETF will represent a continuation of the current reporting approach, there will also be some additional requirements. For example, in addition to reporting on mitigation policies and measures – which is already required in Biennial Update Reports – countries will also need to report on progress indicators to track NDC implementation. GHG projections – something that is currently required from developed countries in their reports but not from developing countries – will also be a feature of the new Biennial Transparency Reports that all countries will need to submit, although this element of the BTRs will be optional.

At the core of the MRV approach for Nigeria is the GHG inventory. The institutional arrangements for the inventory are set out in the Third National Communication. This involves sectoral working groups that sit between the GHG Inventory Division in the Department of Climate Change, and the data providers in MDAs, sub-national government, businesses and civil society. Technical support from international consultants will be used as needed, but a specific requirement of any such support will be that capacity building for Nigerian institutions is built into the specification of work, so that Nigeria can move towards a more self-sufficient arrangement for data compilation and NDC tracking.

Capacity building in the field of MRV has already been ongoing with EU support, with regular training being provided to relevant MDAs. The Department of Climate Change as the National Designated Authority has set up an NDC project register, operational since 2021.

## 7 Support needs

### 7.1 Financial support

Having submitted this updated NDC, a process has been initiated to draw up a detailed NDC investment plan. For the purposes of the updated NDC, an initial exercise was conducted to assess investment needs for delivering the conditional contribution. More information on this can be found in the report ‘Nigeria NDC update: Task 2 and 3 Report: Greenhouse gas and mitigation assessment’<sup>14</sup>. In summary, investment estimates were calculated based on upfront capital expenditures (CAPEX e.g., infrastructure) and, when relevant and available, ongoing operational expenditures (OPEX, including maintenance costs, capacity-building or training, and the human resources needed to implement the action). The investment needs were calculated using constant 2021 prices. This approach is generally used in situations where price evolutions of different technologies cannot be predicted.

The estimated investment required over the implementation period 2021-2030 to deliver the conditional target is estimated to be some 177 billion USD 2021. The bulk of investments, some USD122 billion over 10 years, will need to be targeted at the electricity generation sector, a development priority of the government. Further significant investments are needed in energy efficiency, transport, agriculture, and oil and gas. The aforementioned technical report provides a detailed breakdown of these figures and can guide investment planning. But some caveats need to be noted:

1. The investment needs of up to USD 177 billion over 10 years are economy-wide productive investments, not ‘costs’ exclusively burdening the government budget. The investments to deliver Nigeria’s conditional contribution will be made by domestic and international commercial investors, development partners, both bilateral and multilateral, and the government. International support is required in order for Nigeria to meet this ambitious NDC contribution, using the full range of financing modalities, such as grants, preferential finance and blended finance, and green bonds.
2. In order to meet its development goals, the government is already committed to making significant investments. The investment needs of the 2021 NDC update overlap with these ordinary investments and annual budget spending. It is, however, proving hard to disentangle the additional investments required for the purposes of climate mitigation from such ordinary investments.  
For example, there are many examples of planned investments in the power sector. These are needed to meet Nigeria’s energy access goals. Marginal additional costs may arise from making these investments fully NDC-aligned. Having said that, these additional investments may be expected to pay for themselves through significant development benefits that arise from the economic growth that is expected to be reignited.
3. Some NDC-aligned investments will have already been made as implementation of some mitigation measures started from 2016 onwards.
4. Significant development (co-)benefits are expected to arise from adopting the mitigation measures, which further strengthen the case for climate action. Some economists would deduct the economic development (co-)benefits of these climate actions from the ‘costs’ of their investment. Nigeria does not favour this approach for transparency’s sake. These benefits are not included in the investment needs assessment carried out for this NDC update. Uncertainties in differentiating the economic development (co-)benefits resulting from mitigation actions make such a task exceedingly difficult. Clearly, their quantification would further strengthen the case for ambitious climate action.
5. The cost of inaction is not being considered. Investment needs today will be dwarfed by the adaptation costs (or indeed loss and damage) that lie ahead. Again, their quantification is difficult, but would further strengthen the case for ambitious climate action.
6. Economists recommend utilizing a social cost of carbon in assessing the long-term cost-effectiveness of policies and measures that are not cost-effective today, as these could deliver greater climate and other benefits in the medium to long term. Analysis for the updated NDC

<sup>14</sup> Ibid.

- shows that a social cost of carbon of 51 USD would reduce the 10-year implementation investment needs by 16 billion USD 2021.
7. The discount rate used reflects the cost of lending to the government at 6.63%. This is appropriate for a 10-year investment horizon in a lower-middle income economy.<sup>15</sup> Longer-term modelling, such as for the LTS, would require using a discount rate of 2-3%.<sup>16</sup>
  8. Nigeria does not intend to introduce a carbon price under its first NDC.

Nigeria has a large and vibrant capital market. Nigeria became the first country on the African continent and the fourth globally to place a sovereign bond on the local market. The first bond placed on the market in December 2017 yielded N.10.69 billion. The second bond placed on the market in June 2019 yielded N.15 billion. The bonds were independently certified and significantly over-subscribed. A third bond issuance will take place in 2021. In addition, since 2019, corporate green bonds are being issued on the Lagos market, including by Access Bank Plc and a 15-year infrastructure bond by NSP-SPV Power Corp Plc.

To mobilize the required NDC investments, it is crucial to engage with the capital market. Increased private sector investment for NDC-aligned projects and businesses, requires further changes to the enabling environment, and appropriate blended finance modalities that allow concessional finance to de-risk private investment. Nigeria has been working on this for many years. In 2017, Nigeria participated in the inaugural international Climate Finance Accelerator (CFA), and subsequently held a national CFA workshop and green finance mapping, that led to several important outcomes, including:

- High level participation from four of Nigeria's largest commercial banks.
- Outline term sheets for 13 projects looking for investment of USD500m.
- Five projects (total USD80m) pre-qualified to receive guarantee instruments.
- Important process-related developments, such as development of a proposal for a sustainable national CFA process and mapping of the climate/green finance sector.

The CFA is now a UK government funded global program, active in 8 countries, including Nigeria.

In 2021, Nigeria has appointed, with donor support from Germany and the UK respectively, an economic advisor to undertake a macro impact assessment of the pandemic and prepare an economic recovery resources mobilization plan that identifies opportunities for green jobs creation and green investments, and a climate finance adviser to support development of a climate finance needs assessment and corresponding climate finance strategy. The adviser will build capacity in salient aspects of climate finance and design, including on-the-job training and coaching of MDA staff.

## 7.2 Technology transfer

Technology transfer has been recognized globally for its critical role in responding to the challenges of climate change. There are a number of different aspects to technology transfer, such as the provision of technical and manual skills training, access to scientific and technical information and data and creation of joint R&D projects. To support this process, Nigeria created the National Office for Technology Acquisition and Promotion (NOTAP). It is expected to be the main vehicle for the efficient and effective transfer of technology beneficial to deal with climate change in the future, and has already achieved some notable outcomes:

- The development of technology transfer agreements.
- Intellectual Property Rights awareness.
- Creation of a Patent Information and Documentation Centre (PIDC).

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<sup>15</sup> See [FRB: FEDS Notes: The Social Discount Rate in Developing Countries \(federalreserve.gov\)](#)

<sup>16</sup> See [The Social Cost of Carbon, Risk, Distribution, Market Failures: An Alternative Approach](#) by Nicholas Stern & Joseph E. Stiglitz (2021)

The establishment of thirty-nine (39) Intellectual Property Technology Transfer Offices (IPTTOs) in Universities, Polytechnics and Research Institutions, to:

- o Promote interaction and strengthen the linkage between University/Research Institutions and Industries.
- o Develop a robust intellectual Property Right portfolio through patenting, copyright, technology licensing.
- o Support the Institution's initiative in developing patent culture; and
- o Set in motion the formal system of incentives and reward that encourages individual researcher to involve in partnerships (See [www.notap.gov.ng](http://www.notap.gov.ng)).

There are various barriers to the successful transfer of technology to Nigeria to support climate action, including lack of awareness of available technologies, bureaucratic barriers, poor understanding of the innovation process, tariffs and intellectual property rights, with the last two being the most critical barriers. More information on these are provided in Nigeria's Third National Communication. With support from UNIDO and UNEP, a Technology Needs Assessment is currently being prepared.

Technology transfer will play an important role in delivering the updated NDC, in relation to both mitigation and adaptation action.

### 7.3 Capacity building

There will be a continued need to build capacity to support climate action in Nigeria. Indeed, the Paris Agreement puts capacity building at the heart of global efforts to reduce GHG emissions and increase climate resilience, through the establishment of the Paris Committee in Capacity Building (PCCB). Many of the capacity challenges faced by Nigeria are common to all developing countries and include<sup>17</sup>:

- A lack of public awareness and support for climate action within countries;
- Fragmentation of information, experts and research institutions and lack of training in assessment approaches and methodologies;
- Lack of international support directed at building and retaining long-term organizational and institutional capacity; and
- A need to establish or strengthen permanent institutional arrangements and enabling environments fit for meeting national climate change goals.

Hence capacity building is needed at the individual, institutional and systemic levels. A great deal has already been done, including:

Preparation of five sectoral action plans to guide the implementation of the 2015 NDC in the agriculture, industry, oil and gas, power and transport sectors, supported by UNDP.

A project to strengthen institutional capacity to carry out climate-related MRV was implemented with support from the EU. A capacity building plan tailored to reflect the current level of technical capability of MDAs to carry out MRV was prepared. The Plan included a matrix highlighting capacity building priorities for each sector/ institution. Several specific capacity building workshops were conducted on MRV system development and mitigation assessment.

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<sup>17</sup> <https://www.wri.org/research/how-strengthen-institutional-architecture-capacity-building-support-post-2020-climate>

## Appendices

Appendix A1 – information for clarity, transparency and understanding

## A1 Information for clarity, transparency and understanding

This updated NDC has been designed and written in a way that maximises clarity, transparency and understanding. This appendix builds on this approach by including the specific information required under the Paris Agreement. As an additional aid for transparency, the information is presented against the equivalent information as it would have been presented under the INDC, for ease of comparison. Nigeria wishes to encourage such best practice to be adopted by all countries in future NDC revision rounds.

	2015 INDC comparison	2021 Update of the Nationally Determined Contribution (NDC) of Nigeria
1. Quantified information on the reference point, including, as appropriate, a base year		
a. Reference year(s), base year(s), reference period(s) or other starting point(s)	The reference year for the target is 2030. The objective is expressed as a reduction in total emissions from BAU by 2030, with a base data period of 2010-2014.	The reference year for the target is 2030. The objective is expressed as a reduction in total emissions from BAU by 2030, with a base data period of 2010-2018.
b. Quantifiable information on the reference indicators, their values in the reference year(s), base year(s), reference period(s) or other starting point(s), and, as applicable, in the target year	Total absolute GHG emissions in the base year 2010 were 263.0 Mt CO <sub>2</sub> e and estimated emissions per capita were around 2 tonnes CO <sub>2</sub> e. Under a business-as-usual growth scenario, consistent with strong economic growth of 5% per year, Nigeria's emissions are expected to grow to around 900 million tonnes per year in 2030, which translates to around 3.4 tonnes per person.	Total absolute GHG emissions in the base year were restated and grew from 247 million tonnes CO <sub>2</sub> e in 2010 to 347 million tonnes CO <sub>2</sub> e in 2018. Under a business-as-usual growth scenario, Nigeria's emissions are expected to grow to around 450 million tonnes per year in 2030, which translates to around 1.55 tonnes per person.
c. For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or policies and measures as components of nationally determined contributions where paragraph 1(b) above is not applicable, Parties to provide other relevant information	Not applicable.	Not applicable.
d. Target relative to the reference indicator, expressed numerically, for	20% reduction relative to business-as-usual emissions in 2030 without international support (unconditional)	20% reduction relative to business-as-usual emissions in 2030 without international support (unconditional)

example in percentage or amount of reduction	45% reduction relative to business-as-usual emissions in 2030 conditional upon international support	47% reduction relative to business-as-usual emissions in 2030 conditional upon international support
e. Information on sources of data used in quantifying the reference point(s)	Historical emissions data from Nigeria's Second National Communication and the Energy Commission of Nigeria.	Data to estimate historical GHG emissions came from: <b>Energy</b> Future emissions calculated using the Nigeria 2030 LEAP (Long-range Energy Alternatives Planning System) model, along with official government projections of population and GDP.  The LEAP model contains references to all relevant data sources and key assumptions. The emissions reference values were derived from the relevant IPCC guidelines. Cost estimates were mainly drawn from the detailed World Bank study on Low Carbon opportunities in Nigeria, with additional input from the United Nations Environment Program (UNEP) Greenhouse gas Abatement Cost Model (GACMO of 14 August 2015).
<b>Waste</b>	<b>IPPU AFOLU</b> National Ozone Office Nigeria's Third National Communication Nigeria's Third National Communication Nigeria's Third National Communication UNDP Forestry Report for NDC revision/Forest Reference Emission Level 2020-21  Waste/Circular Economy (CE) analysis for the enhancement of Nigeria's NDC	A new national energy balance supported by IRENA Department of Petroleum Resources 2018 Annual Report Nigeria Household and Living Standards Survey GIZ Power Sector Project 2020-21 OICA data on vehicle population

**Data to inform the BAU scenario were:**

- Nigeria's Economic Sustainability Plan 2020
- GIZ Power Sector Project 2020-21
- Nigeria's Third National Communication
- Agricultural Promotion Policy
- Waste/Circular Economy (CE) analysis for the enhancement of Nigeria's NDC
- Report on Strengthening the Nigerian clean cooking business ecosystem

		WB report 'Assessing Low Carbon Development in Nigeria' – Table 21.1
f. Information on the circumstances under which the Party may update the values of the reference indicators		Nigeria may update the reference indicator under 1.d to account for significant changes (such as changes in Gross Domestic Product (GDP) projections or any technical errors identified) at the point of its next NDC submission, to be prepared in accordance with the Paris Agreement provisions in 2024.
2. Time frames and/or periods for implementation		
a. Time frame and/or period for implementation, including start and end date, consistent with any further relevant decision adopted by the CMA;	Implementation period 2015-2030	Implementation period 2021-2030
b. Whether it is a single-year or multi-year target, as applicable.	Single-year target for 2030	Single-year target for 2030
3. Scope and coverage		
a. General description of the target;	Under BAU, Nigeria's emissions are expected to grow to around 900 million tonnes per year in 2030. Nigeria's NDC is an economy wide GHG emissions limitation target to unconditionally reduce its GHG emissions by 20% below BAU by 2030, rising to 45% below BAU on condition of international support.	Under BAU, Nigeria's emissions are expected to grow to around 450 million tonnes per year in 2030. The Federal Government of Nigeria's reaffirms its commitment to the Framework Convention and the Paris Agreement on Climate Change and its objectives and reiterate its commitment to unconditionally reduce its GHG emissions by 20% below BAU by 2030, and also increases its conditional target to 47% below BAU on condition of international support.
b. Sectors, gases, categories and pools covered by the nationally determined contribution, including, as applicable, consistent with IPCC guidelines;	Sectors covered: Energy (including electricity generation, oil and gas and transport), Industrial Processes and Product Use and Agriculture, Land Use, Land-Use Change and Forestry (LULUCF).  Greenhouse gases covered: carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ) and nitrous oxide (N <sub>2</sub> O).	Sectors covered: Energy (including electricity generation, oil and gas and transport), Industrial Processes and Product Use and Agriculture, Land Use, Land-Use Change and Forestry (LULUCF)  Greenhouse gases covered: carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O) and hydrofluorocarbons (HFCs).

c. How the Party has taken into consideration paragraphs 31(c) and (d) of decision 1/CP.21;	<p>IPCC 2006 Guidelines have been used to prepare this NDC.</p> <p>GHG emissions reductions from the waste sector have not been included because of a lack of available data from the sector.</p>	<p>The GHG mitigation assessment that underpins Nigeria's 2021 NDC update also included assessment of SLCPs including Black carbon, and co-emitted air pollutants (fine particulate matter, organic carbon, nitrogen oxides, non-methane volatile organic compounds, carbon monoxide, sulphur dioxide).</p> <p>IPCC 2006 Guidelines have been used to prepare this NDC. For the oil and gas and waste sectors, the IPCC 2019 refinement was used to quantify GHG emission reduction potentials in these sectors.</p>	<p>In pursuit of the objectives of the UNFCCC and the Paris Agreement, the commitment to the 2030 Sustainable Development Goals, and other major international political commitments such as the Montreal Protocol, Nigeria in its 2015 NDC opted to submit an economy-wide nationally determined contribution. However, whilst included in the scope of the target, emissions abatement was not considered for some sectors such as waste.</p> <p>In preparing this NDC update, the scope of the coverage of the NDC has been extended to all categories of anthropogenic emissions in line with paragraph 31(c) by conducting a more detailed assessment of emissions in the waste sector and of short-lived climate pollutants.</p> <p>Perfluorocarbons, Sulphur Hexafluoride and Nitrogen Trifluoride have not been included because of a lack of import data.</p> <p>Efforts will be made to address the following remaining data gaps over time with the support of international partners.</p>
d. Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans, including description of specific projects, measures	<p>Many of the adaptation actions in Nigeria's INDC will result in mitigation co-benefits. For example:</p>	<p>A range of nature-based solutions and measures in the water sector have been considered as part of this NDC update. For example, in the water sector, measures such as protecting and restoring degraded watersheds</p>	

	Agriculture – better soil management practices will reduce soil-related GHG emissions in the agriculture sector. Forestry – implementation of the National Forest Policy Energy – expanding sustainable energy sources and decentralizing transmission	and initiatives of Parties' adaptation actions and/or economic diversification plans.
4. Planning process	a. Information on the planning processes that the Party undertook to prepare its NDC and, if available, on the Party's implementation plans, including, as appropriate:	A wide-ranging NDC update programme was carried out in Nigeria, supported by various implementing partners of the NDC Partnership under the Climate Action Enhancement Package (CAEP) as well as under UNDP's Climate Promise Programme. Extensive stakeholder engagement took place both on individual work packages under the CAEP and on the mitigation analysis and draft NDC prepared under the UNDP Climate Promise support.
i. Domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner;	The Department of Climate Change (DCC), in the Federal Ministry of Environment, organised several NDC briefing sessions with the Inter-Ministerial Committee on Climate Change (a body that comprise most MDAs). A whole-of-society approach was adopted in engagement with the private sector (through the NDC Business Roundtables), youth, women groups and sub-national authorities and CSOs with link to grassroots communities.	
ii. Contextual matters, including, <i>inter alia</i> , as appropriate:	Nigeria's national circumstances include, among others, a rapidly growing population, food security concerns and risks due to sea level rise, flood and droughts.	See Chapter 1 of Nigeria's Third National Communication for detailed information on national circumstances. That National Communication was submitted just before the Coronavirus pandemic hit Nigeria and this has obviously had a profound impact on the Nigerian economy and on emissions levels.

	b. Best practices and experience related to the preparation of the NDC;	The FGN has prepared an Economic Sustainability Plan and work is underway on a long-term vision, with a view towards submitting a Long-Term Low Emission Development Strategy in due course.  The NDC Partnerships' CAEP support is anchored by two national focal points – the DCC and Department of International Economic Relations (DIER) of the Ministry of Finance – to ensure the linkage between the NDC and the national economic agenda. The CAEP intervention is also focused to ensure green recovery from the Covid, through the engagement of an Economic Advisor.
c. Other contextual aspirations and priorities acknowledged when joining the Paris Agreement;	The INDC promotes delivering on government priorities, including: <ul style="list-style-type: none"><li>• Alleviating poverty</li><li>• Increasing social welfare and inclusion</li><li>• Improving individual well-being, which includes a healthy environment.</li><li>• Access to energy</li><li>• Diversification of the economy</li></ul> The criteria against which potential mitigation actions were assessed in the INDC were:	Through the NDC Partnership CAEP process and the UNDP Climate Promise, extensive and meaningful stakeholder engagement was carried out both to validate the inputs to the NDC update, and to improve buy-in and understanding of the update.  Another strength of the updated NDC for Nigeria is the strong alignment that was made with national development priorities. Key documents such as the Nigeria Economic Sustainability Plan were used as a basis for the emissions projections.  To ensure appropriate domestic funding from national budget, the National Assembly were fully engaged and briefed on the NDC process and their roles.

	Cost effectiveness Mitigation potential Poverty alleviation and job creation Feasibility of implementation Short-term results Gender and social inclusion Health and air quality Land (degradation) and water quality, incl. deforestation
b. Specific information applicable to Parties, including regional economic integration organizations and their member States, that have reached an agreement to act jointly under Article 4, paragraph 2, of the Paris Agreement, including the Parties that agreed to act jointly and the terms of the agreement, in accordance with Article 4, paragraphs 16–18, of the Paris Agreement;	Not applicable.
c. How the Party's preparation of its NDC has been informed by the outcomes of the global stocktake, in accordance with Article 4, paragraph 9, of the Paris Agreement;	Not applicable – a first global stocktake will take place in 2023.
d. Each Party with an NDC under Article 4 of the Paris Agreement that consists of adaptation action and/or economic diversification plans resulting in mitigation co-benefits consistent with Article 4, paragraph 7, of the Paris Agreement to submit information on:	A first global stocktake will take place in 2023. As a member of the Africa Group of Negotiators, and in line with Nigeria's political commitment to the 1.5 degrees objective of the Paris Agreement, this NDC update is significantly more ambitious than the 2015 NDC in terms of the commitment to drive emissions reductions in sectors such as waste, that had no mitigation commitments in the INDC.
i. How the economic and social consequences of response	Not applicable.
	As part of the NDC update, analysis was carried out on both nature-based solutions and the water sector.

measures have been considered in developing the NDC;	Many of the adaptation actions in Nigeria's INDC will result in mitigation co-benefits. For example: Agriculture – better soil management practices will reduce soil-related GHG emissions in the agriculture sector. Forestry – implementation of the National Forest Policy. Energy – expanding sustainable energy sources and decentralizing transmission.	These studies considered the potential mitigation benefits from such measures.
ii. Specific projects, measures and activities to be implemented to contribute to mitigation co-benefits, including information on adaptation plans that also yield mitigation co-benefits, which may cover; but are not limited to, key sectors, such as energy, resources, water resources, coastal resources, human settlements and urban planning, agriculture and forestry; and economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries.	Nigeria does not have a full GHG inventory and accompanying MRV system, as the waste sector is not covered. The LEAP model uses the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories.	In its 2016 GHG inventory included in the Third National Communication submitted in 2020, Nigeria accounted for its anthropogenic GHG emissions and removals using the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories, IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories.
5. Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals	a. Assumptions and methodological approaches used for accounting for anthropogenic greenhouse gas emissions and removals corresponding to the Party's nationally determined contribution, consistent with decision 1/CP.21, paragraph 31, and accounting guidance adopted by the CMA;	During the NDC update process, the historical accounting of GHG emissions and removals was updated to 2018, utilising the latest available data, including an updated energy balance for 2018, and

	b. Assumptions and methodological approaches used for accounting for the implementation of policies and measures or strategies in the nationally determined contribution;	analysis conducted by multiple consultant teams supporting the NDC update, to update the GHG inventory from the Third National Communication to 2018.
	c. If applicable, information on how the Party will take into account existing methods and guidance under the Convention to account for anthropogenic emissions and removals, in accordance with Article 4, paragraph 14, of the Paris Agreement, as appropriate;	The impact on emissions of policies and measures has been calculated using an economy-wide emissions scenario model for Nigeria, implemented in the LEAP (Low Emissions Analysis Platform) software tool. The emission reduction potential of policies and measures was compared against a baseline projection of emissions from 2019 to 2030, that were based on the Federal Government of Nigeria's Economic Sustainability Plan, which accounts for the impact of the COVID-19 pandemic on the Nigerian economy. The LEAP model contains references to all relevant data sources and key assumptions. The emission factors were taken from the relevant IPCC 2006 and 2019 refinement guidelines.
	d. IPCC methodologies and metrics used for estimating anthropogenic greenhouse gas emissions and removals;	See 5 (a).
	e. Sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, as appropriate, including, as applicable:	Nigeria's emissions for CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O are derived using the 2006 IPCC Guidelines
		See 5 (a). The aggregation of GHG emissions have been estimated, and will be reported, using the 100-year time-horizon global warming potential values from the IPCC Fifth Assessment Report.

i. Approach to addressing emissions and subsequent removals from natural disturbances on managed lands;	N/A	The characterisation of net GHG sources and sinks from the Land sector were based on Nigeria's Forest Reference Emission Level (FREL), submitted in 2019, which estimated 2006-2016 average net GHG emissions from Forestry and Other land use to be approximately 32 million tonnes net CO <sub>2</sub> emissions per year. This value accounts only for forestland converted to other land (i.e. deforestation), and does not account for net GHG emissions associated with land degradation. Net emissions from land degradation are estimated to be ~17% of the total net GHG emissions from the forestry sector.  Therefore, for consistency with Nigeria's latest FREL, no allowance was made for natural disturbances within this NDC update.
ii. Approach used to account for emissions and removals from harvested wood products;	N/A	Harvested wood products were not included within this NDC update.
iii. Approach used to address the effects of age-class structure in forests;		Reference is made to the 2019 FREL.
f. Other assumptions and methodological approaches used for understanding the nationally determined contribution and, if applicable, estimating corresponding emissions and removals, including:		<p>i. How the reference indicators, baseline(s) and/or reference level(s), including, where applicable, sector-, category- or activity specific reference levels, are constructed, including, for example, key parameters, assumptions, definitions,</p> <p>Historical cumulative emissions since 1850 for Nigeria were determined using the CAIT database, World Resources Institute. Nigeria's Second National Communication and the Energy Commission of Nigeria were used for more recent historic emissions data.</p> <p>The baseline for assessing emission reduction from land use change and forestry was determined using a deforestation rate of 2.3% year, based on historical trends.</p> <p>Projections for land-use change for the period to 2030 in the baseline take account of the historical trends in deforestation outlined in Nigeria's Forest Reference Emissions Level for 2006-2016.</p>

methodologies, data sources and models used;	Future scenario emissions were estimated using ECN (estimated 2015 emissions) and the LEAP scenarios (conditional and unconditional)	Changes in land use were aligned with emissions factors from the IPCC's 2019 Guidelines for National Greenhouse Gas Inventories to estimate the implications these changes have for both emissions and removals.
ii. For Parties with nationally determined contributions that contain non greenhouse-gas components, information on assumptions and methodological	N/A	The baseline emissions in the energy sector were calculated by developing an energy system model for Nigeria using the Low Emissions Analysis Platform (LEAP), and consistent with an updated national energy balance for 2018 developed for the NDC update. Baseline projections to 2030 in energy consumption and supply, and associated emissions were aligned with economic projections in Nigeria's 2020 Economic Sustainable Plan, and a 2.6% population growth rate. An updated waste sector analysis was undertaken using the IPCC 2006 guidelines first order decay model for solid waste, and taking into account updates in the IPCC 2019 refinement for the solid and liquid waste sectors. Emissions in the waste sector were projected based on the population and economic projections described above for the energy sector.  In the IPPU and agriculture sectors, the Third National Communication emission inventory were the basis for historic emissions from these sectors. IPPU sector emissions were projected based on GDP growth rates from the Economic Sustainability Plan, and in the agriculture sector, livestock and crop production (including fertiliser utilisation) were projected to meet production targets in Nigeria's Agricultural Promotion Policy.

	approaches used in relation to those components, as applicable;	
iii. For climate forcers included in nationally determined contributions not covered by IPCC guidelines, information on how the climate forcers are estimated;	N/A	N/A
iv. Further technical information, as necessary;	N/A	N/A
g. The intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable.		Nigeria is committed to contributing to discussions on international cooperation through Article 6 of the Paris Agreement. Discussions are underway for support for the development of a national carbon pricing/market framework that will enable Article 6 outcomes.
<b>6. How the Party considers that its NDC is fair and ambitious in light of its national circumstances</b>		
a. How the Party considers that its NDC is fair and ambitious in the light of its national circumstances;		This updated NDC is considerably more ambitious than the 2015 Nigeria NDC.
b. Fairness considerations, including reflecting on equity;	<ul style="list-style-type: none"> <li>- Nigeria is a low middle-income country with a large, fast growing population.</li> <li>- Nigeria as a lower-middle income country bears little historical responsibility for the climate crisis, representing just 1% of global total emissions and with historical emissions (1850-2010) estimated at 2,564.02 million tonnes.</li> </ul>	Nigeria as a lower-middle income country bears little historical responsibility for the climate crisis. representing just 1% of global total emissions and with historical emissions (1850-2010) estimated at 2,564.02 million tonnes.
Emissions per capita are around 2 tonnes CO <sub>2</sub> e. Without ambitious mitigation action (BAU), Nigeria's per capita emissions are projected to grow to 3.4 tonnes CO <sub>2</sub> e. Under the 2030 Conditional scenario, the per Capita emissions are expected to remain around 2 tonnes CO <sub>2</sub> e, in line with global targets.		With this NDC update, Nigeria is accelerating its decoupling of economic development from emissions growth. See section 1(f) and 4(c) above.
Nigeria endorses the December 2020 statement by AMCEN ministers on the African Green Stimulus Programme striving towards a more environmentally friendly, resilient, low-emissions and inclusive sustainable development. Building climate resilience is fully aligned with delivery of the 2030 Sustainable Development Goals. The Covid19 pandemic has significantly depressed economic growth in the country.		

		In response, the federal government promptly prepared an Economic Sustainability Plan with a view to providing stimulus to diversify the economy, create jobs and provide access to energy.
c. How the Party has addressed Article 4, paragraph 3, of the Paris Agreement;		This NDC update represents a significant enhancement on the 2015 Nigeria NDC.
d. How the Party has addressed Article 4, paragraph 4, of the Paris Agreement;		Nigeria has prepared this NDC update following ICTU guidance adopted by UNFCCC Decision 4CMA/1 to provide information to facilitate clarity, transparency and understanding.
e. How the Party has addressed Article 4, paragraph 6, of the Paris Agreement.		

7. How the NDC contributes towards achieving the objectives of the Convention as set out in its Article 2

a. How the NDC contributes towards achieving the objective of the Convention as set out in its Article 2;	The NDC contributes to efforts to limit global temperature rise to less than 2°C, with an intention to aim for 1.5°C and to increase Nigeria's ability to adapt to the adverse impacts of climate change.	The NDC contributes to efforts to limit global temperature rise to less than 2°C, with an intention to aim for 1.5°C and to increase Nigeria's ability to adapt to the adverse impacts of climate change.
b. How the NDC contributes towards Article 2, paragraph 1(a), and Article 4, paragraph 1, of the Paris Agreement.		Nigeria significantly contributes more than its fair share to global efforts to eradicate poverty, including by 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, recognizing that this would significantly reduce the risks and impacts of climate change.

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<sup>i</sup> See e.g. HBS, 2010; Abiodun, et al., 2011; Cervigni et al., 2013, Hassan et al., 2013; Oladipo 2013 a&b

<sup>ii</sup> Cervigni et al. 2013