Department of Climate Change
Federal Ministry of Environment

ASSESSING POLICIES & MEASURES TO DEVELOP NDC INDICATORS/TOOLS

Initiative for Climate Action Transparency (ICAT) – Consultancy Project(s) Capacity Building on application of Measure, Report and Verify (MRV) Greenhouse Gas (GHG) Emissions for Mitigating the Impact of Climate Change in Nigeria

December 2021

ICAT Initiative for Climate Action Transparency

CITEPA

ghg management institute

DISCLAIMER

PREPARED UNDER

Initiative for Climate Action Transparency (ICAT) supported by the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, the Children´s Investment Fund Foundation, the Italian Ministry for Ecological Transition, and Climate Works.

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

CIFF CHILDREN'S INVESTMENT FUND FOUNDATION

climateworks FOUNDATION

MINISTERO DELLA TRANSIZIONE ECOLOGICA

The ICAT project is hosted by the United Nations Office for Project Services (UNOPS)

UNOPS

Department of Climate Change
Federal Ministry of Environment

Project Title: Initiative for Climate Action Transparency Project: Assessing P&M To Develop NDC Indicators/Tools

Client:	Federal Ministry of Environment, Department of Climate Change
Project members:	CITEPA, GHGMI, National Consultants and DCC Project Steering Committee
Report title:	Assessing P&M To Develop NDC Indicators/Tools
Report number:	ICAT-MRV-PM01-21
Finalized:	04.03.2022

Table of Content

Abbreviations

AFOLU	Agriculture, Forestry and Other Land Use
BRT	Bus Rapid Transport
BTR	Biennial Transparency Report
BUR	Biennial Update Report
CNG	Compressed Natural Gas
CO_2	Carbon dioxide
CDD	Community Driven Development
DSO	Domestic Gas Supply Obligation
ETF	Enhanced Transparency Framework
FGN	Federal Government of Nigeria
FMoT	Federal Ministry of Transport
FMEnV	Federal Ministry of Environment
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GMP	Gas Master Plan
GTL	Gas to Liquids
ICAT	Initiative of Climate Action Transparency
LASG	Lagos State Government
LULUCF	Land-Use, Land-Use Change and Forestry
MMBTU	One Million British Thermal Units
MPG	Modalities, Procedures, and Guidelines
NBSAP	National Biodiversity Strategy and Action Plan
NCS	National Conservation Strategy
NDC	Nationally Determined Contributions
NGFCP	Nigeria Gas Flare Commercialization Program
NNPC	Nigerian National Petroleum Corporation
NMDPRA	Nigerian Midstream and Downstream Petroleum Regulatory Authority
NOAA	National Ocean and Atmospheric Administration
NTFP	Non-Timber Forest Products
NTP	National Transport Policy
NURPC	Nigerian Upstream Regulatory Petroleum Commission
O&G	Oil and Gas
OTS	Other Transport Sector
P & M	Policies and Measures

PPP	Public-private partnership
REDD+	Reducing Emissions from Deforestation and forest Degradation
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar

List of Figures

List of Tables

Executive Summary

The impacts of climate change are evident around the globe and in all economic sectors. According to 2019, Global Climate Summary from the National Ocean and Atmospheric Administration (NOAA), the upward trend in the globally averaged temperature indicates that more areas are warming than cooling; combined land and ocean temperatures have increased at an average rate of 0.07°C (0.13°F) per decade since 1880; however, the average rate of increase since 1981 (0.18°C/0.32°F) is more than twice as great. The impacts of climate change affect both the environmental and developmental structures of most developing countries, including Nigeria. These impacts are attributed to increased industrial activity by humans and have necessitated the need for mitigation and adaptation actions to reduce and/or prevent a further rise in temperature. Responding to climate change from both mitigation and adaptation perspectives requires strategic approaches from policies, regulatory, and institutional capacities, that must be designed to effectively address the various sectors of the economy.

To track progress towards Nationally Determined Contributions (NDC) achievement, the article 13 negotiations of the Paris Agreement emphasized the development of modalities, procedures, and guidelines (MPGs) for a reporting and review system under the Enhanced Transparency Framework (ETF). Primarily, the ETF specifies how parties must report on progress in climate change mitigation, adaptation measures, and support provided or received. To ensure effective compliance in line with the ETF, the need for assessment of Policies and Measures (P&M) implemented across the NDC priority sectors (Oil & Gas, Transport, and Agriculture, Forestry and Other Land Use (AFOLU)) was imperative, as it is relevant in the development of NDC indicators and tools that are needed in tracking Nigeria's NDC implementation.

Hence, for this report, the available policies, inclusive of the updated NDC, applicable to the various priority sectors were assessed. The assessment (both qualitative and quantitative) of these existing policies across the NDC priority sectors played a vital role in developing the relevant indicators and tools as contained in specific sections of this report, which are needed in tracking the country's progress towards the implementation and achievement of its NDC. While typical indicators have been developed across the principal NDC sectors for monitoring progress, one of the key findings of the report is the fact that some sectors are far ahead of others in terms of actual policy development and implementation that could drive the NDC ambition. Because the indicators are different for each sector, this means that the progress of the NDC may be different at the sector level, too.

Nevertheless, the assessment of the existing sectoral Policies and Measures (P&M) (both qualitative and quantitative) from the various NDC Sectors will provide a good future reference for monitoring the progress of the country's NDC ambition, as the indicators and tools developed will provide sector experts and all relevant stakeholders with the required methodologies to ensure that progress is not only monitored but NDC indicators can be improved upon an ongoing basis.

1.0 Introduction

The impacts of climate change are evident around the globe and in all economic sectors. According to the 2019 Global Climate Summary from the National Ocean and Atmospheric Administration (NOAA), the upward trend in the globally averaged temperature indicates that more areas are warming than cooling; combined land and ocean temperatures have increased at an average rate of 0.07°C (0.13°F) per decade since 1880; however, the average rate of increase since 1981 (0.18°C/0.32°F) is more than twice as great. The impacts of climate change affect both the environmental and developmental structures of most developing countries, including Nigeria. These impacts are attributed to increased industrial activity by humans and have necessitated the need for mitigation and adaptation actions to reduce and/or prevent a further rise in temperature. Responding to climate change from both mitigation and adaptation perspectives requires strategic approaches from policies, regulatory, and institutional capacities, that must be designed to effectively address the various sectors of the economy.

It should be noted that climate-relevant policies and measures are part of the political framework conditions of a country. They are important tools in determining the level, type, and timing of the approach which the government would address climate change. In particularly, these policies and measures are paramount in developing indicators and tools whereby the policies are measured against the sectoral and national set targets, actions taken, scope and coverage, assumptions, and timeframe for mitigating and adapting to climate change. A country with focused climate change policies and measures for both mitigation and adaptation strategies would therefore have a better chance of combating the effects and impacts of climate change.

The Paris Agreement establishes a binding commitment for all parties to prepare, communicate, and maintain a Nationally Determined Contribution and to pursue domestic mitigation measures to achieve the objectives of their NDCs. It is also required that Parties communicate their NDCs every five years and present the information necessary for clarity, transparency, and understanding.

Furthermore, the Paris Agreement establishes, through its article 13, an enhanced transparency framework (ETF) for action and support designed to build trust and confidence and to promote effective implementation. The ETF should, hence, encourage higher ambition and action by making more readily available information both on the progress made by Parties, implementing and achieving NDCs and on the financial, technology development, and capacity-building support provided and mobilized by developed countries, needed, and received by developing countries.

- **New MRV requirements for Nigeria under the ETF**

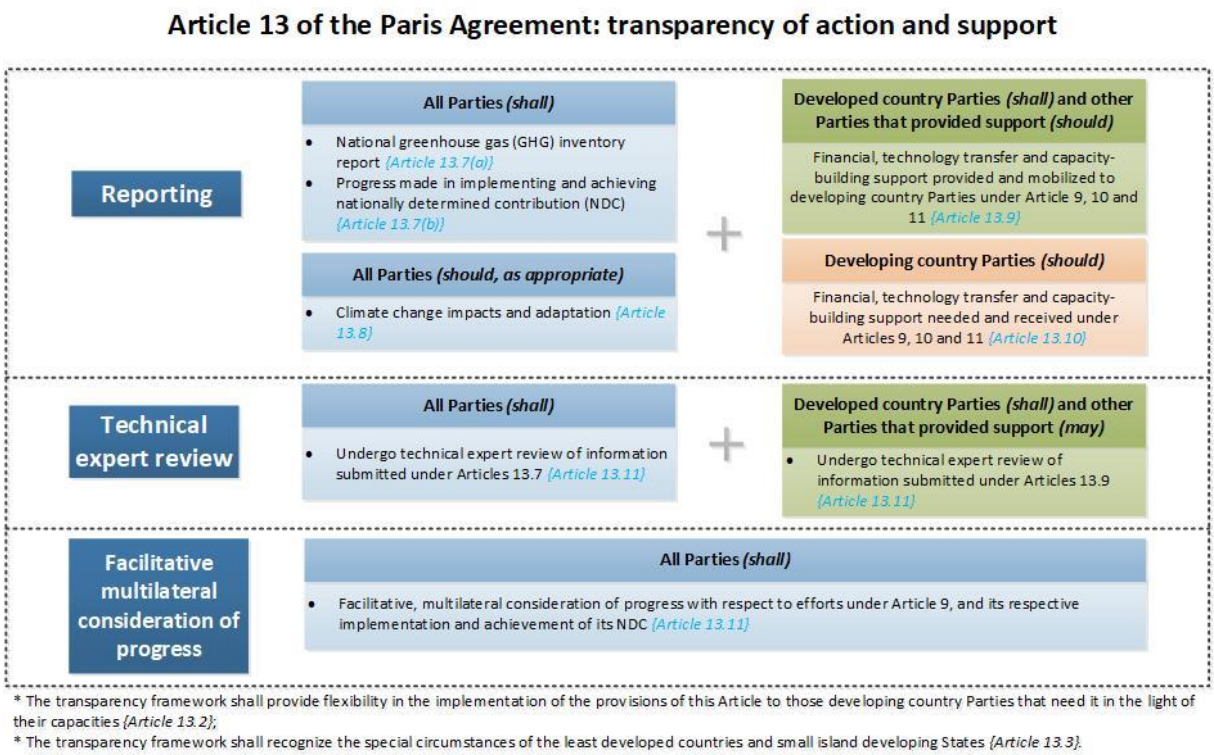
The ETF has new MRV requirements, particularly for Nigeria and other developing countries. Importantly, Article 2, paragraph 2, calls for the implementation of the Paris Agreement to reflect the principles of equity and common but differentiated responsibilities and respective capabilities in the light of different national circumstances. These principles are highlighted in Article 13, paragraph 2, and are specifically mentioned in provisions to offer flexibility to those developing country Parties that need it in the light of their capacities to meet the ETF requirements to enable improved reporting and enhanced transparency by all Parties over time.

Under this transparency framework, Nigeria as a developing country Party:

- shall regularly provide a national inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases (para. 7a of Article 13).
- shall regularly provide information necessary to track progress made in implementing and achieving its NDC (para. 7b of Article 13).
- should provide information related to climate change impacts and adaptation (para. 8 of Article 13);
- should provide information on financial, technology transfer, and capacity-building support needed and received (para.10 of Article 13).

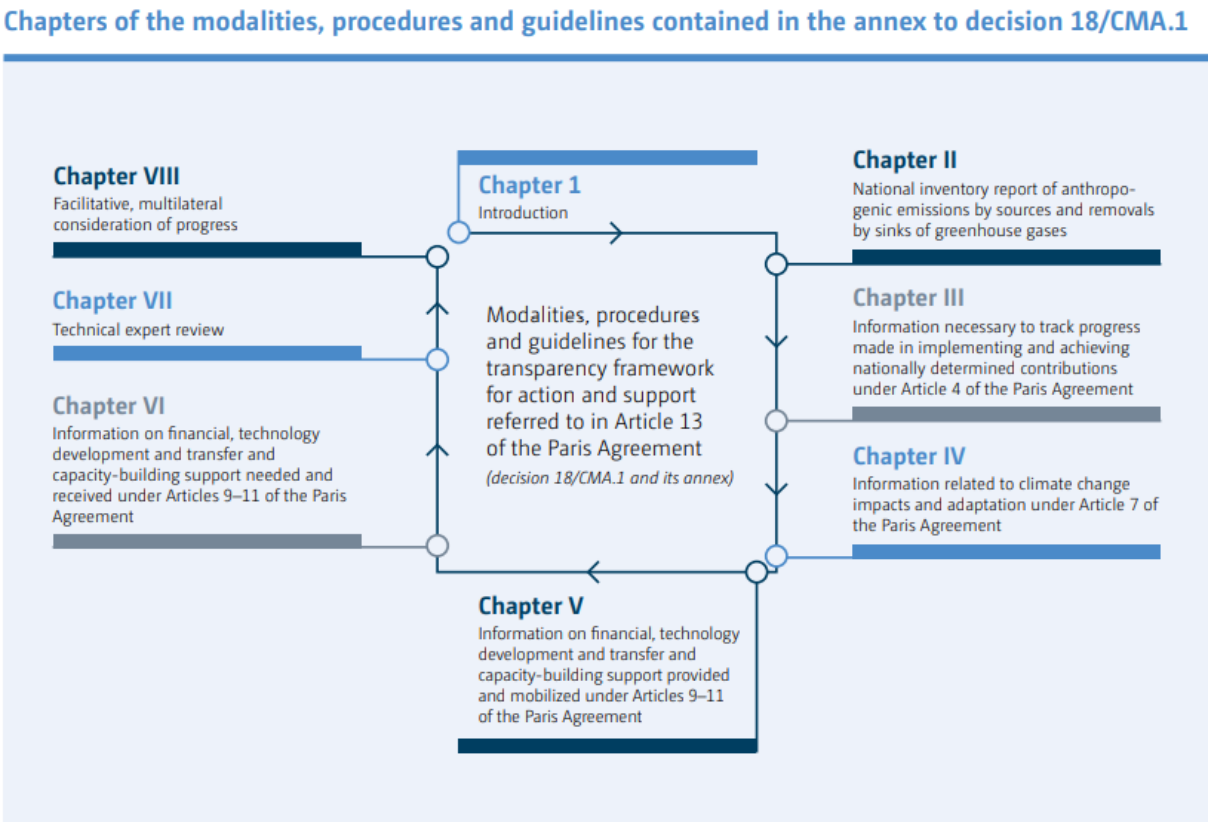
The core arrangements of the transparency framework are illustrated in the figure below.

Figure 1: Article 13 of the Paris Agreement: transparency of action and support



The Modalities, Procedures, and Guidelines (MPG) for the enhanced transparency framework for action and support were agreed by Parties and adopted during the first CMA, held in Katowice in December 2018. The adopted MPGs are contained in decision 18/CMA.1 and its Annex. As illustrated in the Figure below, Annex Decision 18/CMA.1 contains eight chapters elaborating the MPGs for the different parts of the ETF. The final operational guidance, including the common reporting tables, common tabular formats, and outlines for use in reporting the biennial transparency report, was agreed at CMA3 (Glasgow).

Figure 2: Chapters of the modalities, procedures, and guidelines contained in the annex to decision 18/CMA.1



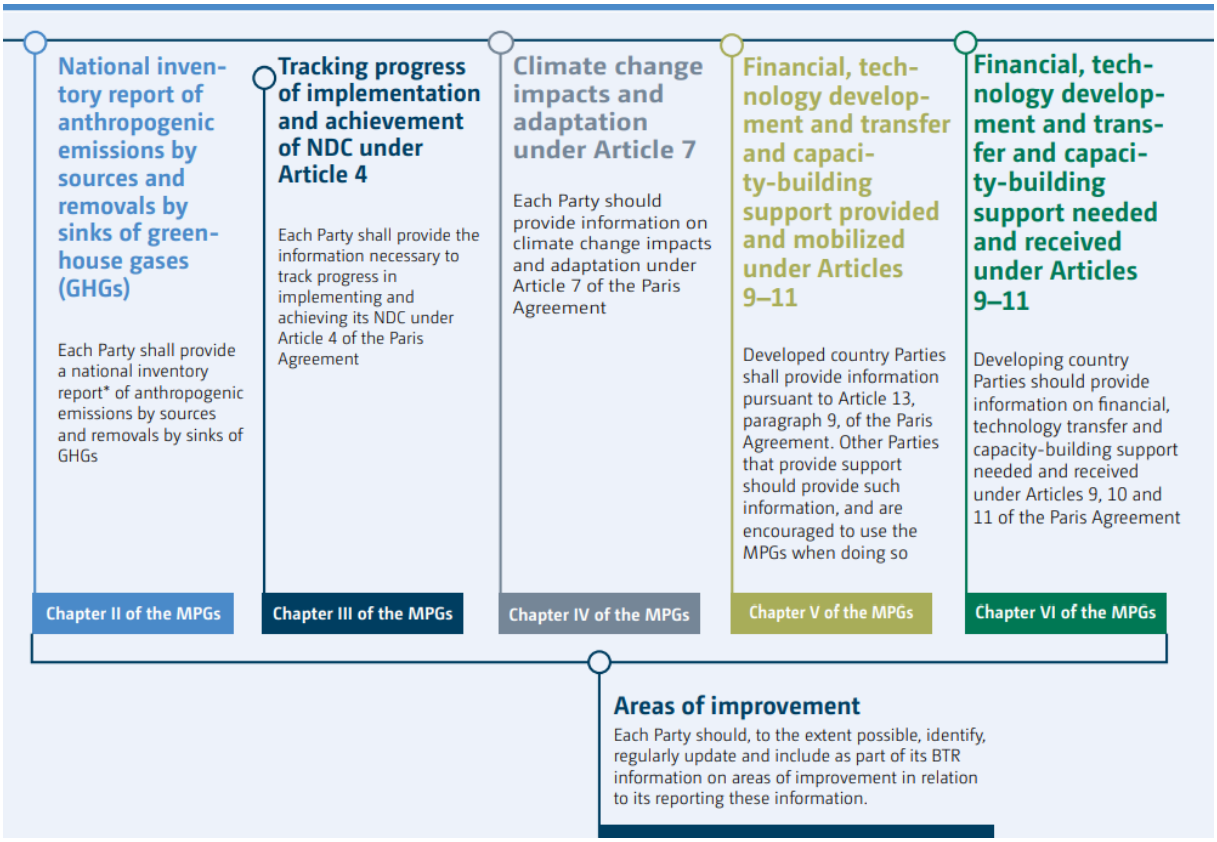
The MPGs will supersede the existing MRV requirements under the Convention (Decision 1/CP.24, para. 39):

- Reporting of the biennial report (BR)/biennial update report (BUR) under the Convention will be superseded by reporting of the biennial transparency report (BTR) for PA Parties.
- Review of the BR and technical analysis (TA) of the BUR under the Convention will be superseded by technical expert review for PA Parties.
- Multilateral assessment (MA) and facilitative sharing of views (FSV) under the Convention will be superseded by the facilitative multilateral consideration of progress (FMCP) for PA Parties.

Information to be reported by Nigeria as part of its BTR

In accordance with the MPGs, Nigeria and all Parties must submit their first BTR and national inventory report (if submitted separately from the BTR), by by December 31st, 2024. The figure below shows the information to be provided by Nigeria and all Parties in the BTR and the corresponding chapters of the MPGs that guide the reporting of that information. To the extent possible, each party should identify, regularly update and include information on areas of improvement in relation to its reporting.

Figure 3: Information to be reported by Nigeria



In accordance with the Outline of the BTR report adopted by CMA3, information to be reported in the BTR by Nigeria and all Parties are as follows:

- National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases
- Information necessary to track progress made in implementing and achieving nationally determined contributions
- Information related to climate change impacts and adaptation
- Information on financial, technology development and transfer and capacity building support provided and mobilized
- Information on financial, technology development and transfer and capacity building support needed and received
- Information to be reported when national communications and biennial transparency reports are submitted jointly every four years
- Information on flexibility
- Improvements in reporting over time
- Any other relevant information
- Annexes

- Annex 1: Technical annexes for Reducing Emissions from Deforestation and forest Degradation (REDD+), as applicable
- Annex 2: Common reporting tables for the electronic reporting of the national inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases
- Annex 3: Common tabular formats for the electronic reporting of:
  - Information necessary to track progress in implementing and achieving nationally determined contributions
  - Information on financial, technology development and transfer and capacity building support provided and mobilized
  - Information on financial, technology development and transfer and capacity building support needed and received
- Annex 4: Information in relation to the Party's participation in cooperative approaches, as applicable

- **Information necessary to track progress made in implementing and achieving Nigeria NDC**

In addition to reporting its estimates of anthropogenic emissions by source and removals by sinks of (Greenhouse Gases) GHGs in the form of a national inventory report, consisting of a national inventory document and common reporting tables, Nigeria and all other Parties shall report information necessary to track progress made in implementing and achieving their NDC in a narrative and common tabular format, as applicable, in accordance with Chapter III of MPGs.

In this respect, Nigeria and all Parties shall provide the following information, as part of its BTR report, to track progress made in implementing and achieving its NDC (chapter II of the BTR and annex 3):

- National circumstances and institutional arrangements.
- Description of a Party's NDC, including updates.
- Information necessary to track progress made in implementing and achieving the NDC.
- Mitigation policies and measures, actions, and plans related to implementing and achieving the NDC.
- Summary of GHG emissions and removals.
- Projections of GHG emissions and removals.
- Other information

Concretely, to track progress made in implementing and achieving its first NDC-update, Nigeria must provide:

1) Information describing its NDC, against which progress will be tracked, including:
   - Target(s), description and the target type(s)
   - Target year(s) or period(s), and whether they are single-year or multi-year target(s);
   - Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s).
   - Time frame(s) and/or periods for implementation.
   - Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools, and gases.

- Intention to use cooperative approaches that involve the use of internationally transferred mitigation outcomes under Article 6 towards NDCs.
- Any updates or clarifications of previously reported information (e.g., recalculation of previously reported inventory data, or greater detail on methodologies or use of cooperative approaches)

According to Nigeria first NDC update report, Nigeria climate target consists of 20%emission reduction compared to the baseline scenario in 2030 without international support (unconditional) and 47% reduction relative to baseline scenario emissions in 2030 conditional upon international support.

Nigeria climate target is a single-year target for 2030

The implementation period is 2021-2030

2) Information necessary to track progress made in implementing its NDC, including:
   - Indicators identified and selected by Nigeria to track progress (Table 1 of structured summary -CTF): which could be:
     - net GHG emissions and removals,
     - percentage reduction of GHG intensity,
     - **relevant qualitative indicators for a specific policy or measure,**
     - mitigation co-benefits of adaptation actions and/or economic diversification plans,
     - other: e.g., hectares of reforestation, percentage of renewable energy use or production, carbon neutrality, the share of non-fossil fuel in primary energy consumption, and non-GHG related indicators

According to Nigeria NDC update report, the global indicator corresponds to the level of emission reduction compared to the baseline scenario in 2030 (unconditional target: 20% below the baseline scenario emissions in 2030; maximum ambition target: 47% below the baseline scenario emissions in 2030).

Other indicators related to sectoral objectives or to specific policy or measure implementation as specified in the "Assessing P&M to develop NDC indicators/tools" report could be also considered by Nigeria.

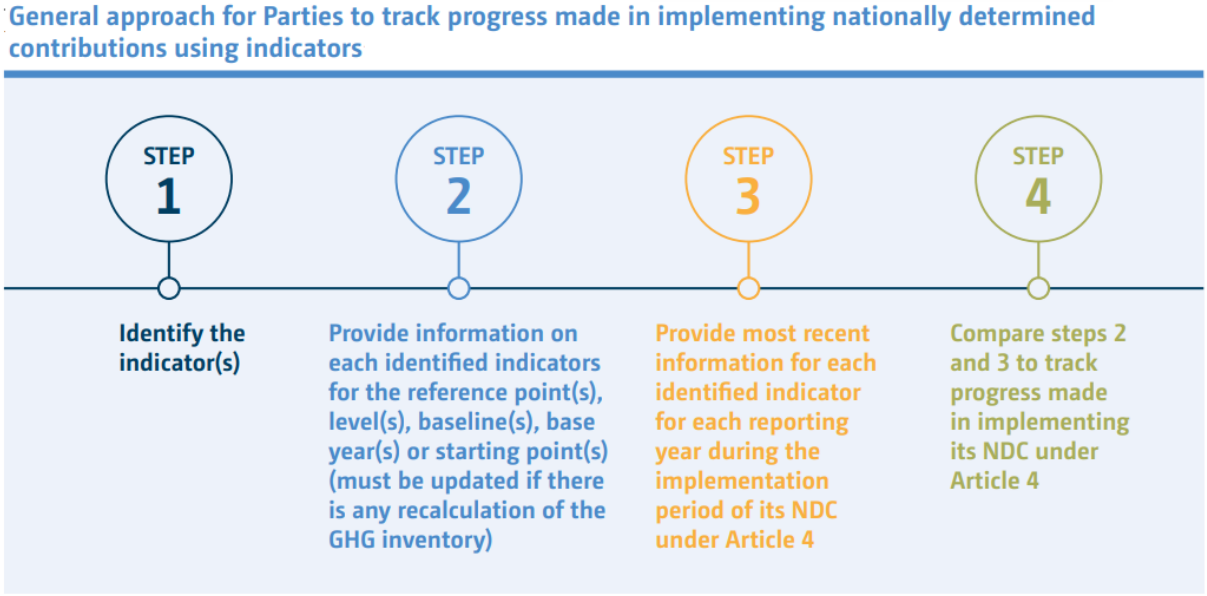
   - Definitions needed to understand the NDC (Table 2 of structured summary -CTF), including:
     - definitions of indicators selected to track progress
     - any sectors or categories defined differently than in the national inventory report
     - mitigation co-benefits of adaptation actions and/or economic diversification plans
   - Methodologies and accounting approaches – consistency with Article 4 (Table 3 of structured summary -CTF), including:
     - Accounting approach, including how it is consistent with Article 4
     - Accounting for anthropogenic emissions and removals in accordance with methodologies and common metrics assessed by the IPCC

- methodological consistency, including on baselines, between the communication and implementation of NDCs
- Striving to include all categories of anthropogenic emissions or removals in the NDC
- participation in cooperative approaches that involve the use of ITMOs

- Tracking progress made in implementing and achieving the NDC (Table 4 of structured summary -CTF):
  - For each selected indicator:
    - ✓ information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s);
    - ✓ information for previous reporting year during the implementation period
    - ✓ most recent information for each reporting year during the implementation period of its NDC

  Progress made towards the NDC, is determined by comparing the most recent information for each selected indicator, including for the end year or end of the period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s).

Figure 4: General approach for parties to track progress made in implementing NDCs using indicators



- Total GHG emissions and removals consistent with the coverage of the NDC
- Contribution from the Land-Use, Land-Use Change and Forestry (LULUCF) sector
- Annual quantity of ITMOs first transferred
- Total quantitative corresponding adjustments

3) Information on mitigation policies and measures, actions, and plans related to implementing the NDC (Table 5 -CTF)

As part of tracking progress made in the implementation and achievement of its NDC, Nigeria shall report necessary information on P&Ms related to implementing and achieving an NDC.

Nigeria and other Parties should focus on information that has the most significant impact on GHG emissions or removals and that affects key categories in the national GHG inventory. This information shall be presented in narrative and tabular format.

Nigeria and other Parties should organize the information submitted, to the extent possible, by the following sectors: energy, transport, industrial processes, and product use, agriculture, LULUCF, waste management, and others. While Nigeria and other Parties are required to provide some information (i.e. the corresponding provision states that "Parties shall" provide such information), reporting of other types of information is recommended (i.e. Parties "should", "may", or "are encouraged" to report the information) as illustrated in the following table.

Table 1: Information to be reported on mitigation policies and measures

Information to be reported on mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans

INFORMATION THAT PARTIES "SHALL" PROVIDE IN A TABULAR FORMAT[84]	INFORMATION THAT PARTIES "MAY" PROVIDE[85]
Name	Costs
Description	Non-GHG mitigation benefits
Objectives	How the mitigation actions interact with each other, as appropriate
Type of instrument (regulatory, economic or other)	
Status (planned, adopted or implemented)	
Sector(s) affected (energy, transport, industrial processes and product use, agriculture, LULUCF, waste management or other)	
Gases affected	
Start year of implementation	
Implementing entity or entities	

Nigeria and other Parties shall also provide, to the extent possible, estimates of the GHG emission reductions expected and achieved as a result of its P&Ms. Those developing country Parties that need flexibility in the light of their capacities with respect to this provision are instead encouraged to report such information. When presenting the expected and achieved GHG emission reductions, Nigeria and other Parties must describe the methodologies and assumptions used to estimate the GHG emission reductions or removals resulting from each P&M to the extent available. This information may be presented in an annex to the BTR.

Further, Nigeria and other Parties should:

- Identify those P&Ms that are no longer in place compared with the most recent BTR and explain why they are no longer in place.
- Identify the P&Ms that influence GHG emissions from international transport.
- Provide, to the extent possible, information about how its P&Ms are modifying long-term trends in GHG emissions and removals.

- Nigeria and other Parties are also encouraged to provide detailed information, to the extent possible, on the assessment of the economic and social impacts of response measures.

The table below summarizes the necessary information to be reported by Nigeria regarding P&M related to the implementation of its NDC.

Table 2: Information to be reported by Nigeria regarding Policies and Measures

5. Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement[a,b]

Name[c]	*Description[d,e,f]*	*Objectives*	*Type of instrument[g]*	*Status[h]*	*Sector(s) affected[i]*	*Gases affected*	*Start year of implementation*	*Implementing entity or entities*	*Estimates of GHG emission reductions (kt CO_2 eq)[j,k]*	
									Achieved	*Expected*

As part of the "Assessing P&M to develop NDC indicators/tools" report, available policies, actions, and measures from the updated Nigeria NDC applicable to the various priorities sector were assessed. The assessment (both qualitative and quantitative) of these P&Ms across the NDC priority sectors (Oil & Gas, Transport, Agriculture and LULUCF Sector), the reporting of NDC mitigation measures according to the common table format, and the development of related indicators according to the common table format as contained in specific sections of this report is an important step towards tracking the country's progress towards the implementation and achievement of its NDC.

It is important to mention that, over time, Nigeria has developed several policies and measures that cut across the relevant NDC sectors. For example, in the Oil and Gas sector, the Nigerian Gas Flare Commercialization Programme was designed strategically to implement the policy objectives of the Federal Government of Nigeria (FGN) to stop routine gas flaring by operators and further reduce GHG emissions. However, more effort is needed to intensify the scaling up and strict implementation of the already existing mitigation and adaptation P&Ms across all sectors to enhance transparency in emissions reporting, development, and modification of P&Ms to better address the increasing vulnerability and impacts of climate change.

This report seeks to review Nigeria's existing climate change P&Ms, towards the development of the NDC indicators or tools across all the relevant NDC sectors. It also presents a qualitative assessment of the existing P&Ms from the various NDC Sectors, explaining the mitigation goals and identifying gaps therein. The report consists of the introductory section and six (6) other principal sections, as highlighted below

Section 2: Focus on assessing Oil and Gas policies and measures

Section 3: Focus on assessing policies and measures from the Road Transport sector

Section 4: Focus on assessing policies and measures in the Other Transport sector

Section 5: Focus on assessing policies and measures in the Agricultural Sector

Section 6: Focus on assessing policies and measures in the Land Use, Land Use Charge, and Forestry Sector

Section 7: Conclusion

2.0 Oil & Gas Sectoral MRV

2.1 Review of Climate Policies and Measures at National Level

The Oil and Gas sector is very important to the Nigerian economy; it constitutes about 9% of the country's gross domestic product (GDP) revenue. Nigeria is Africa's largest oil producer and is richly endowed with abundant natural gas resources. With proven gas reserves of 188 trillion cubic feet (tcf) and the 9th largest gas reserve in the world. The report on Nigerian facts and figures in 2021 by OPEC shows that the Oil and Gas (O&G) sector accounts for about 10 percent of GDP, and petroleum exports revenue represents around 86 percent of total export revenue.

The O&G sector is a major contributor to GHG emissions due to the burning of fossil fuels from exploration and production activities. According to the 2019 report from the United States Agency for International Development (USAID), emissions from the sector increased by 32% from 1990 to 2014, mainly due to fossil fuel combustion, while fugitive emissions, which occur from leaks or other unintended/irregular releases of gases, are another substantial source of GHG emissions.

It is important to note that activities in the Nigeria O&G sector have contributed to the impact of climate change; for instance, extraction, routine gas flaring, and oil spills, have resulted in the environmental degradation of the Niger Delta region. Hence, there is an urgent need to further harness environmental P&Ms to reduce these impacts and contribute towards the country's overall NDC objectives. Although with the current stringent environmental P&Ms being enacted and implemented by the government, it can be said that the situation is improving. However, a lot of work still needs to be done in the general adoption of the policy goals.

Considering the types of policies that have been developed and enacted by the government over the years, it is expected that the sector should be advanced and proactive in meeting international standards. However, there is a yawning gap between policy development and policy implementation.

In developing NDC indicators, some policies in the O&G sector are assessed below. The review of these policies developed by different governments, points out key aspects that relate to the overall objective of the Nigerian NDC, thus relevant in tracking progress and developing indicators.

2.1.1 Nigeria Gas Master Plan (GMP)

The Nigerian Gas Master Plan was approved in 2008 as part of the government's commitment towards making the O&G sector a major player in the international gas market and laying a solid framework for gas infrastructure expansion within the domestic market.

The Masterplan is a guide for the commercial exploitation and management of Nigeria's gas sector. The main strategies of the GMP, which aim at growing the Nigerian economy with gas are highlighted below:

- Stimulate the multiplier effect of gas in the domestic economy.
- Position Nigeria competitively in high-value export markets.
- Guarantee the long-term energy security of Nigeria.

Key Elements of the Gas Master Plan

To achieve its objectives, the Nigeria Gas Master Plan was developed with three key elements.

- **The Domestic Gas Supply Obligation (DSO)**: the DSO mandates gas producers in the country to set aside a certain amount of produced gas for the domestic market. Each industry player is expected to submit a gas production and supply plan in line with the objectives of the Domestic Gas Supply Obligation and backed by the National Gas Supply and Pricing Regulations of 2007. Defaulters of this regulation were expected to pay a fine of $3.5/mcf for non-compliance.

- **Commercial Framework (Gas Pricing Policy):** the gas pricing policy, ensures that natural gas is supplied at an affordable price to all the domestic sectors, mainly power and other sectors having a significant multiplier effect on the nation's economy. A breakdown of the pricing mechanism adopted for this policy is highlighted below.
  - **The Strategic Domestic Sector:** This applies to natural gas used to power both residential and commercial users. The supply of gas to this sector is at the lowest commercially sustainable price, and it is regarded as the sector with the highest multiplier effect on the economy.
  - **The Strategic Industrial Sector:** This sector covers all industries that use gas as the main feedstock, such as fertilizers, methanol, Gas to Liquids (GTL), etc. The policy was expected to make prices as competitive as obtainable in other parts of the world.
  - **The Commercial Sector:** This applies to sectors that use gas as a fuel as opposed to feedstock. Compared to the two previous classifications, projects in this category provide potential direct revenue earnings for Nigerian gas because of their capacity to bear high gas prices as the competing alternative fuel is Low Pour Fuel Oil (LPFO). Included in this category are cement and domestic manufacturing industries, industrial Power etc.
- **The Gas infrastructure blueprint:** This is another key element of the Gas Master. This element is divided into gas gathering or processing and gas transmission. It focuses on reducing the overall infrastructure cost; flexible supply to the nationwide grids as well as aligning strategies and infrastructure to deliver the aspiration of the Gas Master Plan.

This policy supports the achievement of the O&G sectoral measures as stated in the NDC which are targeted at eliminating flaring by 2030; projected to save around 64 million tons of carbon dioxide (CO_2) per year. The World Bank estimates that this would have a net benefit of $61 per ton and could be combined well with other mitigation measures such as the substitution of diesel generators with natural gas-fired electricity generation. Activities from the policy geared towards supporting the actualization of mitigation goals in the sector include:

- Creation of a robust, scalable, and fully connected gas infrastructure that supports the three markets concurrently and cost-effectively, taking gas from any source to any market.
- Transformation of the domestic gas market into a vibrant and fully commercial gas market. The gas price stimulates investment in supply; also, the sustainability of the market, complimenting the other regional and export Liquefied Natural Gas (LNG) markets enables a balanced portfolio.
- The attraction of more widespread participation by new players stimulates competition and efficiency.

2.1.2 Nigerian Gas Flare Commercialization Programme (NGFCP)

The Nigeria Gas Flare Commercialization Programme (NGFCP) was launched in 2016 as a strategy to implement the policy objectives of the government for the elimination of gas flares with potentially enormous multiplier and development outcomes for the country.

The objective of the NGFCP was to eliminate gas flaring through technically and commercially sustainable gas utilization projects developed by competent third-party investors who will be invited to participate in a competitive and transparent bidding process. The policy was intended to:

- Reduce the environmental and social impact caused by the flaring of natural gas.
- Protect the environment.
- Prevent waste of natural gas.
- Create social and economic benefits from gas flares captured.

The Federal Government presented a policy position indicating that routine gas flaring from production sites is unacceptable. The government also indicated that flared gas should be harnessed to stimulate economic growth, drive investments, and provide jobs in oil-producing communities and indeed for Nigerians through the utilization of widely available innovative technologies.

Hence, NGFCP offers flare gas for sale by the Federal Government of Nigeria through a transparent and competitive bidding process. The bidding process will allow competent third-party investors to utilize the gas that would have been otherwise flared from the flare sites. The Flared gas would be made available at a price the successful investors have bid on and it would be used as fuel and/or feedstock in a proven gas utilization technology.

In line with the Flare Gas regulation, the NGFCP objective was to eliminate gas flaring from flaring sites in Nigeria through technical and commercial gas utilization projects. While the major mitigation goal of the programme is to reduce gas flaring, which is in line with the NDC measure of zero flaring by 2030 and a reduction of Fugitive Methane emissions by 60%, it should be noted that a comprehensive fugitive methane policy/regulation for the sector is not yet available. However, successful effort has been made by the Department of Petroleum Resources (DPR)[1] now the Nigerian Upstream Regulatory Petroleum Commission (NURPC) and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA) and the Clean Air Task Force in the development of guidelines for achieving fugitive methane emission reduction in the O & G sector. The guideline document has been sent across to all sector stakeholders for their inputs and comments. This is intended to have the stakeholders point out areas that were not fully covered in the earlier developed draft, hence making the guidelines comprehensive; and taking into cognizance the peculiarities of all the companies that make up the sector.

[1] The newly introduced Petroleum Industry Act (PIA) 2021 established the Nigerian Upstream Regulatory Petroleum Commission and the Nigerian Midstream and Downstream Regulatory Authority to take up the responsibilities and thereby dissolving the DPR.

2.1.3 Flare Gas Regulation

On July 5, 2018, the Flare Gas Regulation came into full effect to govern and implement the NGFCP. The regulation was also developed to reduce gas flaring through the prohibition of the flaring of Natural Gas. It was established that operators that produce at least 10,000 bpd shall be liable to a flare payment of $2 per 28.317 standard cubic meters of gas flared. However, operators that produce less than 10,000 bpd shall be liable to a flare payment of $0.5 per 28.317 standard cubic meters of gas flared.

The Flare Regulation also handed the Federal government the right to take all the flared gas at no cost from the flare sites without payment of royalty to the operator. In addition, the government has the right to issue a permit to third party bidders to access the flare gas based on a transparent bidding process. This regulation, therefore, was geared to reduce flaring, which is a major emission reduction target in the Nigerian NDC.

2.1.4 National Gas Policy

The Nigeria gas policy document was developed upon the policy goals of the Nigerian Government for the gas sector as presented in the Seven Big Wins initiative that was developed by the Ministry of Petroleum Resources (MPR) and the Nigeria's Economic Recovery and Growth Plan (ERGP) 2017–2020). The policy was intended to remove the barriers affecting investment and development within the gas sector. It proposed an implementation plan for the introduction of an appropriate institutional, legal, regulatory, and commercial framework for the gas sector. The policy was expected to be reviewed and updated periodically to ensure consistency in government policy objectives, as it covers all activities in the Upstream, Midstream and Downstream of the gas sector.

From 2008 to 2015, the government policy to harness Nigeria's vast gas resources was based on the GMP, which outlines the objectives and aspirations of the nation concerning its gas resources. However, with minimal investments made in the gas sector over the period, the plan has not delivered on all its set targets. For example, Nigeria still lacks critical gas infrastructure and continues to fall short of meeting its domestic gas supply obligations. The objective of the Gas Policy was to transition Nigeria from being oil-based to being an oil and gas-based industrial economy. The major mitigation goals from the policy include:

- Achievement of gas flare-out through gas utilization projects by harnessing the available flare reduction technologies.

Other activities that will further enhance these mitigation objectives include:

- Identification and prioritized development of key gas infrastructure.
- Liberalized access to offshore and onshore gas transmission infrastructure and gas processing plants.
- Imbibing a maintenance and safety culture.
- Identifying new gas resources, growing reserves, and diversifying gas supplies

Table 3 below shows the summary of the existing O&G policies and their implementation entities.

Table 3: Existing O&G Policies Programs and their Implementing Entities

	Exiting O&G Policies	Sector and GHG Affected	Status	Entity Responsible
1	Nigerian Gas Master Plan	Energy	Implemented	Ministry of Petroleum Resources, Nigerian National Petroleum Corporation (NNPC)
2	National Gas Flare Commercialization Programme (NGFCP)	Energy	Implemented	Department of Petroleum Resources, Ministry of Petroleum Resources, International Oil Companies, National Oil Companies, Independent oil companies
3	National Gas Policy	Energy	Implemented	Ministry of Petroleum Resources, IOCs, NOC, Independent oil companies
4	Flare Gas Regulation	Energy	Implemented	Ministry of Petroleum Resources, Department of Petroleum Resources
5	Nigerian Gas Expansion Program	Energy	Implemented	Central Bank of Nigeria .

2.2 Qualitative Assessment of Policies and Measures

2.2.1 Mitigation Goals from Policies

The qualitative assessment of the existing policies and measures in the O&G sector involves the identification and assessment of the inherent mitigation goals. Thus, this section highlights the different mitigation goals from the above-mentioned policies, and this is important as tracking mitigation goals gives insight into how well the country is faring in terms of achieving and meeting its NDC targets. Several countries include policies and measures in their NDCs that will enable the achievement of mitigation goals. For Nigeria's NDC, the O&G sector policies and regulations point towards achieving two principal objectives:

- Gas flare reduction
- Reduction in Fugitive Methane, which has recently been added in the updated NDC

Thus, the review of the identified policies for the oil and gas sector (Nigeria Gas Master Plan**,** National Gas Flare Commercialization Programme (NGFCP)**,** Flare Gas Regulation, and the National Gas Policy reveals that their mitigation goals align with the NDC measures as stated in the NDC update for the Oil and Gas sector, which includes:

- Improved enforcement of gas flaring restrictions
- Development of Gas-to-Power Plants at Gas Flare Sites (microgrid)

Apparently, measures put forward for the sector in the recently updated NDC, are strongly supported by the reviewed policies. The mitigation goal updated for the O&G sector includes:

- Zero flaring by 2030
- 60% reduction in Fugitive Methane by 2031

With the primary focus of assessing how well the country is faring in terms of achieving and meeting its NDC targets, it is important to track mitigation goals, and these should be adequately measured and reported in CO_2eq. Table 4 below summarizes the mitigation goals from the existing policies of the O&G sector.

Table 4: Summary of Major Mitigation Goals from Oil and Gas Policies

	Exiting O&G Policies	Mitigation Goals from oil and Gas Policies	NDC Mitigation Measures
1	Nigerian Gas Master Plan	Reduction in emissions by: • Creation of a robust, scalable, and fully connected gas infrastructure that supports gas utilization. • Transformation of the domestic market into a vibrant and fully commercial gas market; and • Introduction of a maintenance and safety culture.	• Zero Gas flaring by 2030 • 60% reduction in Fugitive Methane emission by 2031
2	National Gas Flare Commercialization Programme (NGFCP)		
3	National Gas Policy		
4	Flare Gas Regulation		
5	Nigerian Gas Expansion Program		

Despite the regulation of the O&G sector through the existing laws, policies, and several other regulatory measures; there are several gaps observed in the P&Ms. The gaps and relatively weak regulatory policy framework, particularly in the implementation process, have resulted in the country's experiencing limited achievements and less economic development. It is, however, imperative that a maturing oil-dependent economy such as Nigeria, develops viable and implementable regulatory frameworks to maximize the developmental value of its O&G resources.

Recently, the Nigerian government has enacted laws, policies, and measures to further regulate the operations of players within the sector in a bid to increase sustainable development and build a stronger local economy. Some of the policies state penalties for defaulters. However, policy inconsistency in terms of dealing with core issues (corporate governance and human resources) and the lack of strict follow-up and monitoring for compliance have contributed to weakening the level of achievement. Another key policy gap that has long existed in the sector is that while some policies and measures in the sector indicate the country's mitigation goals and targets in terms of achieving the NDC goals in line with the Paris Agreement, some of the mitigation goals do not seem measurable as the policies do not spell out how much emission reduction is expected through implementing mitigation projects. This presents a big challenge, as countries must be able to measure and track their mitigation efforts to know how they are faring in terms of achieving their NDC targets.

To achieve more progressive results from the regulatory policies and measures that govern the sector, it is important for the government, policymakers, and other relevant regulatory agencies to re-appraise the underlying laws, policies, and measures. Due attention should be paid to overarching, prevailing issues in a bid to address these issues.

Also, efforts should be concentrated on reappraising fundamental issues that will contribute measurably towards ensuring transparency on critical issues bordering the sector. Strict monitoring measures for

compliance by all sector players must be put in place to ensure compliance with set policies and measures. Governments and other regulatory agencies must also ensure that policies are fine-tuned to reflect current industry realities.

2.2.2 Gaps in Existing Policies and Measures

For the identified policies and measures, pitfalls and gaps have made it impossible and, as such, slowed down the achievement of the objectives and goals of these policies. These gaps are related to various parameters, which include an inadequate legal framework to support policies, technical shortcomings, poor capacity building, and poor implementation strategies of the existing policies. Seemingly, these gaps are directly or indirectly related to the indicators and the mitigation measures. Also, the probability of poor awareness, negligence, and inadequate attention to pertinent issues, within the sector, has led to missing policies and measures. These are characterized by poor regulation and awareness and non-implementation of mitigation strategies within key areas of emission reduction within the O&G sector. It is therefore pertinent to create awareness and devise implementation strategies to make the policies sustainable. Table 5 below highlights the Gaps in the Existing Policies of the O&G sector.

Table 5: Gaps in the Existing Policies of the O&G sector

S/N	Exiting O&G Policies	GAPS
1	Nigerian Gas Master Plan	• Lack of political and economic will • Bureaucratic bottle necks • Existing infrastructure is insufficient to meet gas demands
2	National Gas Flare Commercialization Programme (NGFCP)	• Lack of capacity and technology transfer amongst industry players • Lack of dedicated lending facility to implement gas projects
3	National Gas Policy	• Lack of awareness of these policies by prospective investors • Lack of adequate infrastructure
4	Flare Gas Regulation	• Lack of enforcement of the regulation • Inadequate implementation strategy on policies
5	Nigerian Gas Expansion Program	• Not applicable

2.2.3 NDC Mitigation Measures

The tables (6-8) below elaborate on each of the mitigation measures that occur within the O&G sector. Various parameters gave an in-depth explanation of these measures, and they include, objectives, type of instrument, status, sector affected, gas affected, implementation year, implementing entities and the non- GHG benefits. These parameters give clarity to the assessments of the NDC mitigation measures and their set targets.

Table 6: Overview of the "Gas Flare Reduction" Mitigation Measures

Name	Gas Flare Reduction
Description	This mitigation measure implores commitment from the government and oil companies to end routine flaring by the year 2030
Objectives	The objective is to achieve zero Gas Flaring by 2030
Type of instrument	Regulatory
Status	Implemented
Sectors Affected	Oil and Gas Sector
Gas Affected	CO_2, GH_4
Start Year of Implementation	2016
Implementing Entities	Department of Petroleum Resources (DPR) now NUPRC and NMDPRA and Stakeholders e.g., NNPC, IOCs
Methodologies and assumptions to estimate GHG emission reductions	CDM Methodology AM0009, AM0037 and AM0077 This methodology is applicable to project activities that recover and utilize associated gas from oil fields that would have been either vented or flared.
Achieved GHG emission reductions	Records not yet available
Expected GHG Emissions Reductions by 2030	16,572 ktCO2-eq
Non-GHG Mitigation Benefits	Air pollutants and black carbon reduction.

Table 7: Overview of the" Fugitive Methane Reduction" Mitigation Measures

Name	Fugitive Methane Reduction
Type of instrument	Regulatory
Description	In 2019, Nigeria published its National Action Plan to reduce short-lived climate pollutants joining the Global Methane Alliance and pledging to absolute methane reduction targets of at least 45% by 2025 and 60-75% by 2030. The 60% conditional reduction by 2031, in the updated NDC, is geared towards propelling some legally binding policies in Nigeria over the coming year. Nigeria has just joined the Methane reduction pledge.
Objectives	The objective is to achieve a 60% reduction in fugitive methane emissions by 2031
Status	Planned
Sectors Affected	Oil and Gas
Gas Affected	CH_4
Start Year of Implementation	2021
Implementing Entities	Department of Climate Change (DCC), Federal Ministry of Environment, NURPC and NMDPRA, NNPC, IOC, and the NOC
Methodologies and assumptions to estimate GHG emission reductions	CDM Methodology AM0023: AM0023 methodology is applicable to project activities that reduce leaks in natural gas pipeline compressor stations and gate stations in natural gas long-distance transmission systems.

Achieved GHG emission reductions	Records not yet available
Expected GHG Emissions Reductions by 2030	190,737 ktCO2-eq
Non-GHG Mitigation Benefits	Job creation, Capacity development, Infrastructural development, just transition, Gender and Youth empowerment and Subnational action

NDC Indicators for Oil and Gas Sector

As an overarching criterion, it is essential to identify and select an indicator(s) to track progress towards the implementation and achievement of sector specific NDC targets. The choice of the indicator can be self-determined, and the indicators need to be relevant to the country's NDC and should be quantitative, especially as it relates to mitigation actions.

It is important to note that when selecting indicators, the following information needs to be put into considerations:

- Description of methodologies and accounting approaches used.
- Description of how the indicators selected are relevant to the NDC.
- information pertaining to the reference point(s), level(s), year(s), baseline(s), base year(s), or starting point(s);
- Information for each previous reporting year during the implementation period of the NDC; and
- The most recent information available for such an indicator.

Therefore, building on the information listed above, it is important to track progress towards implementation and achievement of the NDC target(s) especially as we move closer to the BTRs by comparing the most recent information on selected indicators with their respective reference points(s), level(s), year(s), baseline(s), base year(s) or starting point(s).

Table 8: Oil and Gas NDC Indicators for tracking progress

S/N	Mitigation Measures	Objective	Indicators	Description	Parameter for Comparison for Indicators
1.	Gas Flare Reduction	• Zero gas flaring by 2030	Share of natural gas flared in total gas production	• Annual natural gas flare volume per total gas production (%) and CO2 emissions from flaring (CO2eq)	• Volume of gas flared in 2016 was about 8% of produced associated gas.
2.	Fugitive Methane Reduction	• 60% reduction in fugitive methane emissions by 2031 from 2018 baseline	• Total Fugitive Methane emissions adequately measured and reported from vents and valves of the oil and gas facilities.	• Annual fugitive Methane emissions CO_2-eq measured and reported from vents and valves of the oil and gas facilities	• In 2018, emissions from the energy sector was 60% of the total energy sector emissions) •

			• Numbers of Operators trained, and Technology used for Methane Measurement	• The numbers of trained operators depict advanced measurement technological tools **(**MIST, COMAT) in measuring Methane emissions	• Fugitive emissions accounted for 36% of total emissions (largest share) in 2018[2]

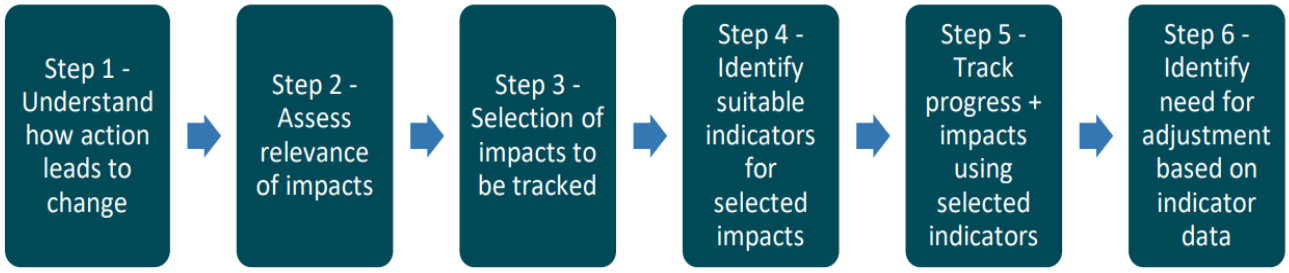
Tracking NDC Mitigation Actions in the O&G Sector

Tracking mitigation actions is important for two reasons:

- to monitor whether mitigation actions are on track and being implemented as planned.
- to monitor whether mitigation actions achieve their anticipated impact or effects, within the expected timeframe and at the projected cost.

However, to achieve the above, accurate and consistent carbon inventories are essential for identifying the main sources of emissions, and comparison of carbon reduction progress would help inform targeted policies for low-carbon transition. The Figure below details the typical steps involved in tracking mitigation actions.

Figure 5: Steps in tracking mitigation actions



Source: Climate Footprint Project

Table 9: O&G *Sector* NDC Mitigation Actions and Tracking Measures

S/N	Mitigation Measures	Data Source	Tracking Measures
1	Gas Flare reduction		• Annual trend of daily logs of flared and vented associated gas submitted to the NURPC and NMDPRA from oil companies/ facilities compared to the previous year reported. • Comparison of conformity of the log data report from the installed metering equipment on the facility with the metering and data collection standards of the NURPC and NMDPRA • Reconciliation of the NURPC and NMDPRA's published annual report (collated from the

[2] IRENA Energy Balance, 2018

		NURPC and NMDPRA, NNPC and all the 0perators	operators) with the annual flare gas data reported by the individual operators • Ensure timely build-out of gas infrastructure to direct associated gas resources for domestic use • flare meter installations: installation of flare meters to monitor flare volumes • Tonnes of GHG emissions reduced as a result of a gas flare reduction policies and projects (for instance through the Gas flare commercialization program) • Records of the composition and quantity of associated gas produced by oil and natural gas processing facilities • Review the quantity and carbon intensity of any additional energy consumed for transportation purposes or for the processing of the associated gas as a feedstock material by the end use facility. • Records of fugitive emissions of methane along the associated gas transport pipeline (including from accident events).
2	Fugitive Methane reduction	NURPC and NMDPRA, NNPCs and all the Operators	• Estimation of leaks quantified from O&G facilities based on LDAR program • Benchmarking trend of daily logs of fugitive emissions submitted to the NURPC and NMDPRA by the operators to the estimated annual emissions. • Comparing methane emissions reported annually with the records from the previous year • Use of cameras, drones, and other technological devices to observe the number of leaks compared to the earlier reported • Ensure timely build-out of gas infrastructure to direct associated gas resources for domestic use. • Records of date of monitoring equipment • An assessment of whether the relevant equipment has been replaced after the repair of leaks • The number of hours the relevant equipment was operating (not turned off) since the last monitoring inspection • An assessment whether the repair of the leak functions appropriately.

3.0 Transport Sector MRV

3.1 Review of Climate Policies and Measures at National Level

The Transport Sector remains one of the biggest emitters of GHG emissions in the country due to its heavy dependence on fossil fuels. The high emission rate in the sector has been largely attributed to the movement of people and goods all over the country through the various modes of transportation, especially road transportation. The predominant use of road transportation over the other modes has also, over time, resulted majorly in environmental problems and a high frequency of road traffic accidents.

Since independence in 1960, the Nigerian transport sector has continued to wallow in crisis and is confronted by myriads of problems. The sector has suffered major challenges from the lack of stringent policies and, in cases where the policies exist, there are issues of poor implementation/monitoring compliance with the policies.

This section highlights existing "Statements" and Policies in the Transport Sector.

3.1.1 The 1993 Transport Policy for Nigeria

The 1993 Transport Policy was developed to respond to the extreme malfunctioning of the country's transport system and the complexities of the associated problems. It stated that "the Nigerian transport system functions in a crisis" because of "a major imbalance between the needs of Nigerian society and the economy for adequate transport facilities and the ability of the transport sector to meet such demands". This document emerged as the first National Transport Policy (NTP) and was termed "Moving out of the Crisis". The focus was to achieve modal development within the context of the twin goals of adequacy and efficiency. The goal of achieving *efficiency* is associated with optimizing the feedstock (energy) consumed for transportation. The efficient utilization of fuel allows for a reduction in GHG emissions due to the better utilization of fuel consumption per mile of distance covered in transportation. To achieve the objective of the policy, the government embarked on transport facility construction and rehabilitation, with the result that different sub-sectors continued to grow and develop independently.

3.1.2 The 2003 Draft National Transport Policy Document

This Draft NTP was built on the 1993 Transport Policy. It was commissioned by the Federal Ministry of Transport (FMoT) in 2003 to address central concerns and unhealthy intermodal competition evidenced by the neglect of certain transport modes, such as Rail and Inland Waterway Transport. It was observed that the country was burdened with an over-reliance on road transport, with about 90% of people and goods movement in the country being road based. It was therefore the desire of the government to embark on network integration, intermodal operations to achieve a seamless transport system.

The policy had as its thrust "integrated transport" with its fundamental goals being the provision of an adequate, safe, efficient, and environmentally – friendly transport system. It was widely observed that the policy thrust was drawn from the experience of the United Kingdom (UK). The UK published in 1998 in an Integrated Transport White Paper the need for a modal shift and a transport policy in its transport system. "*We cannot go on as we were, trying to build more and more new roads to cope with a growing level of traffic. Instead, we must have more real transport choices, better buses and trains, a better deal for the motorist, better-maintained roads, a railway working for the passenger, more money for public transport, more freight on the railway, and a safer and more secure transport system. Developing an integrated transport policy, therefore, represents a major shift*

in direction. We don't just want to stop traffic problems getting worse; we want to make things better for people and goods on the move" (Department of the Environment, Transport and the Regions (DETR), 1998).

It should be noted that despite the good aspirations and intentions of the 2003 draft NTP document, the policy document only existed in draft form.

3.1.3 The 2010 Draft National Transport Policy

In August 2010, the federal government set up the machinery to produce a final National Transport Policy document that will guide the efficient development of the country's transport sector. This document came more than 17 years after the first attempt at having a coherent NTP in 1993.

The fundamental goal of this policy was to develop an adequate, safe, environmentally sound, efficient, and affordable integrated transport system within the framework of a progressive and competitive market economy. Some of the policy objectives, among many others, included:

- to promote the use of public transport over private cars, which enhances mass transit movement.
- to improve the safety, security, reliability, quality, and speed of movement of goods and people, at local, national, and international levels.
- to develop transport infrastructure that ensures environmental sustainability and internationally accepted standards; and
- to support states and the federal capital territory in the development and promotion of urban transport systems and local governments in developing and promoting rural accessibility.

The document also emphasized the governments' plan to be involved in public-private partnerships (PPP) and the need for an independent regulatory body that would plan and facilitate the private sector-driven transport system. The regulatory body was considered important since the government and the private sector cannot be the players and at the same time the regulators.

Specifically, for the road transport sector, the goal of the above policy draft was to achieve adequate and efficient maintenance of the existing road network and to promote private sector investment in the upgrade and maintenance of roads through Public-Private Partnership (PPP) while its objectives were to generate new sources of revenue to close the resource gap; measure efficient road maintenance and rehabilitation and protect the roads from premature deterioration.

It should be emphasized that to date, Nigeria remains in critical need of a national transport policy that would define the degree of government and private sector involvement, build a compelling inter-modal transport system, and in addition, elucidate vehicular usage of the different transport infrastructures within the country with the goal of achieving the set targets of the NDC. However, efforts are still being made to develop an NTP. In 2017, The Ministry of Transportation inaugurated a 19-man Committee to finalize the review of the National Transport Policy draft. This review also involved drafting policies for the Transport sub-sectors. However, the NTP draft document has to date not been implemented.

3.1.4 National Water Policy (2004)

This policy seeks an improvement in the management of the nation's water resources, vulnerabilities, and hydrological risks. This is to encourage the mass transit application of the water system for transportation. This is expected to reduce GHG emissions.

The policy documents are intended to guide transport investment and planning while also laying out long-term infrastructure plans, policies, and frameworks aimed at accelerating the delivery of road infrastructure and other critical infrastructure. The Master Plan prioritizes the expansion of national highway networks, improvements to urban transport networks, with initiatives such as dedicated bus lanes, motor parks, and traffic control systems.

Transport Policy Implementation in Nigeria

The government at different times, has taken steps towards implementing the targets highlighted in the draft policies. Some of such attempts are seen in the following initiatives:

- The urban mass transit program/ initiative of the federal government,
- The shipping policy initiative of the government

Policy Reforms in the Transport Sector

Highlighted below are policy reforms that have been initiated over time by the Nigerian government

- Road sector reforms
- Port sector reforms
- Rail sector reforms
- Reforms in the inland waterways sector
- The policy on public-private partnership (PPP)
- Urban Mass Transit Program: Initiated in 1988 with the creation of the Federal Urban Mass Transit Agency (FUMTA) and State Mass Transit Agencies as the implementing agents. However, this program failed because the policy intent was not understood and FUMTA did not have the human resources to implement it.
- The Shipping Policy Initiative: The National Maritime Authority, now referred to as Nigerian Maritime Administration and Safety Agency (NIMASA), was created in 1987 to implement the policy under the National Shipping Act of 1987, which was reviewed in the Merchant Shipping Act of 2007.

Transport Sector Reforms

Government reforms in the Transport sector led to the creation of the following agencies.

- The National Roads Authority
- The National Roads Fund
- The National Railway Authority
- The National Ports and Harbor Authority
- National Inland Waterways Authority- this already exists, but its functions will be streamlined to fit the "landlord model" role and to enable private sector participation in the inland waterways business.
- National Transport Commission- as the economic regulator in the sector, except for Aviation.

3.1.5 Sub-national Policies

At the sub-national level, states in the country have also seen the urgent need to develop transport policies that would enable efficient and sustainable state transport sectors. There have been attempts, through statements and drafts, by some states aimed at developing state transport policy. For instance, Lagos State, which is regarded as the economic and commercial capital of Nigeria with an estimated 23,305,971 population, has

experienced challenges in its transportation sector. However, with the government's intentions to transform the city-state into Africa's model megacity and a global economic center, it became necessary to adopt different instruments (laws) to manage the transport sector. However, this is yet to be combined into a single transport policy. Some of the instruments used in managing the Lagos transport sector are highlighted below.

- **Lagos State Strategic Transport Master Plan:** The plan identifies possible transport infrastructure and services required for meeting travel demand by 2032, seven (7) years above the projections of Lagos State Development Plan 2012 – 2025.
- **Lagos Road Traffic and Administration Law 2012:** This law, termed the Lagos Road Traffic Law 2012, presents the responsibilities of the Lagos State Traffic Management Authority (LASTMA) in control and management of vehicular traffic in the State. The responsibilities include general regulation of traffic on public highways, prohibition of a certain mode of transportation in specified areas, and regulation of the conduct of operators.
- **Public Bus Services Reform:** The goal of this law is to rebrand the state transport system and ensure the efficiency of bus services in Lagos State. Commercial bus drivers will now wear uniforms approved by the Lagos State Government (LASG). It also contains a code of conduct for bus drivers as well as passengers.
- **Lagos State Waterways Authority Act: The** Lagos State Waterways Authority (LASWA) enacted the act in 2008 to enable a long-term regulatory environment that attracts significant private sector involvement in the provision of water transport services. Through LASWA, the LASG has embarked on policy reforms that promote and facilitate investments for the provision of water transport aimed at realizing potentials towards becoming an attractive mode of transport.

3.2 Qualitative Assessment of Policies and Measures

The use of P&Ms as instruments and indicators to track the impacts of climate change and monitor achievement of NDC targets cannot be overemphasized. This process enables governments and all relevant decision-makers to understand the status of the country's emissions and strategize on how to further mitigate the impacts of climate change.

3.2.1 Mitigation Goals from Policies

All the reviewed draft policy initiatives indicated the need to promote modal development by specifying measures covering funding improvements for all the transport modes, for instance, the rehabilitation and modernization of rail assets, concession of roads for construction and maintenance, road, and rail access to Seaports etc. The policies also indicated economic instruments such as road user charges and port charges, among others, as sources of funds. Other policy goals include reducing government involvement in service provision, directives to marketing boards to transport their products through the railway, training of private transport operators to improve their efficiency, etc. it can be said that the country's NDC target for the sector reflects some of the policy goals.

All the drafted policies have good aspirations and intentions for the Transport sector. However, the major challenge has been in moving the policies from the draft form to the implementation stage.

Table 9 below highlights the policy thrusts, goals, and objectives from the reviewed policies in Section 3.1 above.

Table 9: Mitigation goals from reviewed policies

S/N	Policy Initiatives	Policy Thrusts	Goals	NDC Mitigation Goals
1	1993 Policy	Modal development	Adequacy and Efficiency	• 100,000 Extra buses by 2030 • Increase Bus Rapid Transport (BRT) by 2035 • 25% of trucks and buses using Compressed Natural Gas (CNG) by 2030 • All Vehicles meet EURO III emission limits by 2023 and EURO IV by 2030
2	2003 (Draft) Policy	Integrated Transport	Adequacy, Efficiency, Affordability, Safety, and Environmental Friendliness	
3	2010 (Draft) Policy	Public-private Partnership (PPP)	Adequate and efficient maintenance of already existing road network; promote Private Sector investment in the upgrade and maintenance of roads through public-private partnership (PPP)	

Source: Adapted from Analysis of Policy Documents, 2012

To achieve the mitigation goals that are set out above for the Transport Sector, the following recommendations are proffered.

- Undertake drastic and consistent reductions in fossil fuel consumption.
- Switch from petrol-based and diesel-powered road vehicles to sustainable transport, e.g., trains, ferries.
- Infrastructure upgrade: This requires substantial and sustained investments in technologies and modal infrastructure, particularly those meant for operation's (i.e., provision of transport services).
- Electrify transport modes; but in Aviation; this looks impossible on long-distance, international routes. The only possible ways/alternatives for international flights are the use of synthetic gas (i.e., syngas from household rubbish), hydrogen, or biofuels (made from food waste or algae). For short-distance flights, aircraft could be electrified. In Railway, e-mobility is possible as trains could be electrified; thus, creating room for HST in Nigeria. In Maritime and Inland Waterways, Seaports and river terminals can be electrically powered and serve as points/ sources of energy supply to ships and ferries when stationary at seaports and river ports respectively. Unfortunately, the electricity power system is inefficient and erratic in Nigeria, in terms of power generation; transmission, and distribution; thus, unable to meet the increasing demands for power supply by the nation's economy.
- Restricting travel to very important ones would help to curb emissions, e.g.:
    - Travel by trains instead of planes for long-distance journeys.
    - Use of mass transit trains, LRT, Metros, Ferries, or switch to non-motor raised modes (i.e., walking, bicycling) for short distance journeys.
- De-emphasizes financing high-carbon generating sectors of the economy and concentrates more on funding sustainable low-carbon generating sectors. This is achievable by putting carbon tax regimes to incentivize the shift from high-carbon to low-carbon sectors of the nation's economy.
- Encourage sustained and large-scale investments in Research and Development.
- Emplace strong National Climate laws and regulations to achieve mitigation goals from Policies.

3.2.2 Gaps in Existing Policies and Measures

The reviewed policies are identified with some gaps, as shown in Table 10 below. Importantly, there is currently no existing NTP for the sector and the above-mentioned policies are in the draft stage, and this situation has contributed largely to the epileptic state of the sub-sectors and the sector at large.

Table 10: Policy Gaps

S/N	Policy Initiatives	Gaps
1	1993 Policy	• Policies are only in draft form • There is no implementation strategy • Lack of legal framework to support policies • Insufficient funding to implement policy projects • Inadequate infrastructure • Finance: Government is unable to unlock private sector participation in the form of well-structured and depoliticized Public-Private Partnerships arrangements. • Difficulty in adopting scientific modelling approach for the transport sector • No or low level of Stakeholder and political support • Lack of or insufficient data which causes: o Inability to estimate mitigation potential, properly. o Difficulty in having a scientific modelling approach that supports ambitious targets in Other Transport Sector (OTS). o Difficulty in assessing synergies between mitigation and adaptation. o Difficulty in preparing and implementing NDCs, properly. • Lack of IA, limits NDCs development and Implementation processes. Co-ordination, collaboration, co-operation, and consultation amongst transport modal agencies and supervisory Ministries are difficult to achieve e.g., between FMoT and FMoA). • Existence of budgetary constraints (from appropriation by legislative Arm to funds' release by Federal Ministry of Budget and National Planning). • Faulty integration of climate change policies with other Government Policies due to poor understanding of climate change issues. • Absence of focal points (i.e., nodal - modal – sectoral -national - international) in transport modal agencies. • Climate change issues are not yet properly mainstreamed into National Development Plans, National Vision and National Budgets. • Lack of expertise in transport modal agencies in technical areas.
2	2003 (Draft) Policy	
3	2010 (Draft) Policy	

3.2.3 NDC Mitigation Measures

These measures are considered necessary to minimize environmental impacts associated with the Nigerian transport sector. The Tables (11-14) below are a description of the mitigation goals for the transport sector as presented in the newly updated Nigeria NDC.

Table 11: Overview of the 100,00 extra buses by 2018 to 2030

Name	100,000 Extra buses by 2030
Type of Instrument	Regulatory
Description	The government has stated its commitment to provide 100,000 extra buses by 2030.
Objective	The objective of this mitigation measure is aimed at reducing GHG emissions by reducing the number of small vehicles on the roads.
Status	Ongoing
Sector Affected	Transport
Gas Affected	CO_2, CH_4, N_2O
Start Year of Implementation	2020
Implementing Entities	Federal Ministry of Environment and all Relevant Ministries in the Transport Sector
Methodologies and assumptions to estimate GHG emission reductions	AM0031, ACM0016
Achieved GHG Emissions Reductions	Not Available
Expected GHG Emission Reductions by 2030	
Non-GHG Mitigation Benefit	Job Creation, increase travel efficiency to reduce air pollutants emissions

Table 12: Overview of Increase Bus Rapid Transport (BRT) by 2018 to 2035

Name	Increase Bus Rapid Transport (BRT) by 2035
Type of Instrument	Regulatory
Description	BRT, also called a busway or transitway, is a bus-based public transport system designed to have better capacity and reliability than a conventional bus system.
Objective	The objective of this mitigation measure is aimed at reducing GHG emissions by increasing BRT which is expected to account for 22.1% passenger-km by 2035.
Status	Ongoing
Sector Affected	Transport
Gas Affected	CO_2, CH_4, N_2O
Start Year of Implementation	2020
Implementing Entities	Federal Ministry of Environment and all Relevant Ministries in the Transport Sector
Methodologies and assumptions to estimate GHG emission reductions	AM0031, ACM0016
Achieved GHG Emissions Reductions	Not Available
Expected GHG Emission Reductions by 2030	60,019 $ktCO_2$
Non-GHG mitigation Benefit	Green Job, increase travel efficiency, increase fuel efficiency, reduce air pollutants emissions

Table 13: Overview of 25% of trucks and buses using Compressed Natural Gas (CNG) by 2018 to 2030

Name	25% of trucks and buses using Compressed Natural Gas (CNG) by 2030
Type of instrument	Regulatory
Description	The government has stated its commitment to ensuring that transport vehicles use CNG in other to reduce the burning of fossil fuel during transportation.
Objective	The objective of this mitigation measure is aimed at reducing GHG emissions by increasing the use of CNG by trucks and buses by 2030
Status	Ongoing
Sector Affected	Transport
Gas Affected	CO_2, CH_4, N_2O
Start Year of Implementation	2020
Implementing Entities	Federal Ministry of Environment and all Relevant Ministries in the Transport Sector
Methodologies and assumptions to estimate GHG emission reductions	AMS-III.S., AMS-III.AQ.
Achieved GHG Emissions Reductions	Not Available
Expected GHG Emission Reduction by 2030	3,253 $ktCO_2$-eq
Non- GHG Mitigation Benefit	Improved air quality

Table 14: Overview of Vehicles meet EURO III emission limits by 2018 to 2023 and EURO IV by 2018 to 2030

Name	Vehicles meet EURO III emission limits by 2023 and EURO IV by 2030
Type of instrument	Regulatory
Description	The government's commitment is to ensure that all vehicles meet Euro III and Euro IV standards
Objective	The objective of this mitigation measure is aimed at reducing GHG emissions by ensuring that all vehicles in the country comply with the Euro III and Euro IV standards.
Status	Ongoing
Sector Affected	Transport
Gas Affected	CO_2, CH_4, N_2O
Start Year of Implementation	2020
Implementing Entities	Federal Ministry of Environment and all Relevant Ministries in the Transport Sector
Methodologies and assumptions to estimate GHG emission reductions	AMS-III.S.
Achieved GHG Emissions Reductions	Not Available
Expected GHG Emission Reductions	116,159 $ktCO_2$-eq
Non- GHG Mitigation Benefit	Improved air quality by reducing air pollution by introducing more severe standards.

Indicators for Monitoring Mitigation Actions

Indicators play a crucial role in monitoring mitigation actions as they provide good evidence-based impacts, progress and performance results that help policy and decision-makers on climate issues. In Transport Sector, the following indicators can be used to track progress towards NDC implementation; specific GHG emissions from the transport sector, specific GHG emissions of passenger cars concerning mileage travelled, specific road

transport fuel consumption, specific road transport vehicle fleet complying with the highest emission standards, use of alternative fuels in transport, among others.

It should be mentioned that defining and putting in place the most appropriate and practicable indicators can be challenging due to factors such as data availability and the difficulty of measuring actual progress towards increased resilience, which are commonly evident in the Nigerian Transport Sector. However, Table 15 below presents the indicators that can be used to monitor the progress of the mitigation actions presented in the Nigeria NDC for the sector.

Table 15: NDC Mitigation goals and Indicators

NDC Mitigation Actions	Objective	Indicators	Description
• 100,000 Extra buses by 2030	reduce congestion and spending on fuel	Specific road transport fuel consumptions	Annual CO2-eq emissions from the transport sector (Mt) per final energy consumption (PJ)
• 25% of trucks and buses using CNG by 2030	Reduce overall spending on fuel	Use of alternative fuels in transport	Share of alternative fuels consumption compared to the total energy consumption in the transport sector (%)
• BRT will account for 22.1% of passenger-km by 2035	reduce congestion and spending on fuel	Specific GHG emissions of passenger cars concerning mileage travelled	Annual fuel consumptions of road transport vehicles (MJ) per distance travelled (km)
• All Vehicles meet EURO III emission limits by 2023 and EURO IV by 2030	Reduce fuel consumption	Road transport vehicle fleet complying with highest emission standards	Share of vehicles complying with highest emission standards compared to the total road transport circulating fleet (%)

Adapted from: ICAT Report: "Proposed indicators for domestic MRV purposes and tracking progress of NDCs"

Table 16: Transport Sector NDC Mitigation Actions and Tracking Measures

S/N	Mitigation Measures	Data Source	Tracking Measures
1	100,000 Extra buses by 2030	• FMoT in collaboration with the Federal Government. • Federal Road Safety Commission	• Companies should be mandated to report their carbon footprints. This can be used subsequently to benchmark against further emission reduction reports. • Once annual emissions and emissions intensity are set, setting a science-based-target can be considered based on decarbonization pathways for the sector. • Contact authorities concerned with data records to validate the number of buses available. • Confirm how many buses ply the roads and the capacity of passengers. • Fuel consumption records based on measurement of a representative sample, international literature, IPCC values related to local circumstances and distance driven based on official statistics • Records of distance driven are measured annually by GPS; fuel efficiency is based on measurement.
2	25% of trucks and buses using CNG by 2030	• FMoT in collaboration with the Federal Government. • Federal Road Safety Commission • NNPC	• Determine the total amount of tons-miles of vehicles before trucks were acquired and use that as a benchmark for emissions from trucks. Data can be obtained from NNPC, which supplies the operators with bulk fuel. • Compare purchase records for CNG compared to diesel. • Determine company/operator records, e.g., driver logs and route maps or sales receipts. • Monitored data before project begins (i.e., before trucks and buses are deployed) • Purchase or consumption records, whose higher value is taken to ensure conservativeness • Inspection of vehicles during the annual road worthiness test and random checking of vehicles to know those who have yet to carry out the annual road worthiness test.

			• Data of vehicles that meet this standard should be provided by the relevant authorities and shared among other road enforcement agencies.
3	BRT will account for 22.1% of passenger-km by 2035	• Ministry of Industry • Federal Road Safety Commission • Customs • Vehicle Inspection Officer	• FRSC can also be obliged to collect the data both at the state and national level. • Records of the number of mass transit buses produced in the country annually can be obtained from Ministry of Industry. • Customs records of newly imported cars • Records of traffic flows and distance driven by passenger cars and taxis compared to BRT records
4	• Federal Road Safety Commission • Vehicle Inspection Officers	• Federal Road Safety Commission • Vehicle Inspection Officers	• Determine company/operator records, e.g., driver logs and route maps or sales receipts. • Monitored data before the project begins • Purchase or consumption records, whose higher value is taken to ensure conservativeness • Inspection of vehicles during the annual road worthiness test and random checking of vehicles to know those who have yet to carry out the annual road worthiness test. • Data of vehicles that meet this standard should be provided by the relevant authorities and shared among other road enforcement agencies.

Analysis of Sustainable Development Indicators Associated with Mitigation Measures in Nigeria's 2021 NDC Update

The analysis presented here was carried out by the New Climate Institute using the mitigation targets presented in the newly updated Nigeria NDC to show the sustainable development indicators associated with mitigation measures.

As earlier mentioned, Nigeria's 2021 updated NDC includes four headline mitigation measures for the transport sector. Table 17 below provides a detailed mitigation analysis for the updated NDC using LEAP.

Table 17: Transport Sector Mitigation Analysis for Updated NDC

Mitigation Measures	Scenario	Relative reduction from Baseline by 2030	Absolute reduction from Baseline by 2030 ($ktCO_2$-eq)
100,000 Extra buses by 2030	NDC 2015	0.0%	0
25% of trucks and buses using CNG by 2030	NDC 2015	0.1%	510
BRT will account for 22.1% of passenger-km by 2035	Enhanced Ambition (Updated 2021 NDC)	2.7%	14,080
All Vehicles meet EURO III emission limits by 2023 and EURO IV by 2030	Enhanced Ambition (Updated 2021 NDC)	3.1%	12,140

According to the analysis, Road transport emissions account for 13% of 2030 economy-wide emissions in Baseline. The analysis also showed that:

- Passenger travel accounts for most road transport emissions, with only a limited impact from freight.
- Baseline and Intended Nationally Determined Contribution (INDC) emissions trajectories are almost identical: rising emissions driven by gross domestic product (GDP) and population growth.
- Emissions initially fall sharply, followed by a slower decline in the unconditional scenario.

Identification Of Decarbonization Co-Benefits

Table 18 below shows options for analyzing road transport potential sustainable development impacts of mitigation measures.

Table 18: Potential Sustainable Development Impacts of Mitigation Measures

Mitigation Measure	Congestion (travel Time)	Fuel Savings	Air pollution health impacts
• 100,000 Extra buses by 2030	The modal shift can reduce congestion	The modal shift can reduce spending on fuel	The modal shift can reduce adverse health impacts
• 25% of trucks and buses using CNG by 2030	No impact	Fuel switch can impact overall spending on fuel	Fuel switch can impact health outcomes
• BRT will account for 22.1% of passenger-km by 2035	The modal shift can reduce congestion	The modal shift can reduce spending on fuel	The modal shift can reduce adverse health impacts
• All Vehicles meet EURO III emission limits by 2023 and EURO IV by 2030	No impacts	Emissions standards can reduce fuel consumption	Emissions standards can reduce adverse health impacts

Quantification of co-benefits

At the end of the analysis, the following were the estimates of non-climate sustainable development impacts associated with road transport mitigation measures as contained in the Nigeria NDCs:

- Billions of hours are lost in congested traffic every year, representing major economic losses.
- Economic losses from delays exceed United States Dollar (USD) 3.5bn per year in Lagos alone
    - Car users account for USD 1.4bn economic losses by 2030 and motorcyclists account for USD 0.28bn

- The unconditional scenario includes the national modal shift of a similar number of motorcycle users and 40% more car users to BRT by 2030.
- Additional economic losses due to increased fuel use in congestion and higher emissions are not included.
- This analysis was based on monthly average wages of USD 167 (NGN 68, 600).

- Phasing out 70,000 new buses (BRT) saved 29billion hours and USD 13.6bn over the decade
  - By 2030, 70k new buses will displace 3.2m cars and 1.7m motorcycles, accounting for 111bn passenger-kms. Annual economic savings for bus users can exceed USD2bn by 2030.
  - We assume BRT is largely uncongested and can travel at an average speed of 50km/h
  - The average speed of cars and motorcycles is 17km/h
- Fuel consumption in the Baseline scenario continues to rise year-on-year
  - Fuel consumption in the Baseline scenario is 20bn Liters of gasoline-equivalent in 2020, rising to 25bn Liters by 2030
  - Cars and minibuses represent 90% of total road transport fuel consumption between 2020 and 2030
- Fuel consumption is limited in the Unconditional scenario by emissions standards and modal shift
  - More stringent emissions standards implemented from 2020 reduce fuel consumption by 20% for all vehicle types
  - The shift in activity to buses displaces gasoline consumption from cars to a lesser extent motorcycle
  - Annual fuel consumption remains approximately 15bn liters of gasoline equivalent (Lge) up to 2030
- Unconditional scenario saves the equivalent of 74bn Litres of gasoline over the decade
  - Fuel savings rise from close to 4bn lge in 2020 to approximately 10bn lge in 2030
  - Minibuses and cars drive the reduction in fuel use
  - Fuel consumption by buses rises over time due to the increase in transport activity by bus
- Spending on fuel is approximately 27$bn lower in Unconditional scenario:
  - Annual spending on fuel is 3.5$bn lower in 2030, with cumulative savings of 27$bn over decade
  - Fuel savings are equivalent to around 0.5% of national GDP
  - Reduced fuel consumption can also lower government outgoings on fuel subsidies
- Health impacts from road transport air pollution rise steeply over time in the Baseline scenario
  - Road transport emissions in the Baseline scenario would lead to 12,000 premature deaths or 161,000 years of life lost between 2020-2030
  - Health impacts from road transport emissions have economic cost on the order of 2$bn over decade
- Mitigation measures in the Unconditional scenario prevent at least 3,000 premature deaths
  - Reduced fuel combustion (due to emissions standards and modal shift) can prevent 500 deaths a year by 2030 and 6,500 years of life lost
  - Cumulatively over the decade measures can prevent 3,300 premature deaths and 44,000 years of life lost
- Mitigation measures in the updated NDC reduce costs from air pollution by USD 560 million
  - The economic value of avoided health costs rises to over USD 80m a year in 2030
  - Cumulative benefits over the decade are on the order of USD 0.56bn
  - The magnitude of benefits is likely to be higher when considering additional impacts such as:
    - Premature deaths amongst children
    - Increased prevalence of non-fatal illness (e.g., respiratory problems)

- Mitigation measures for the Nigerian road transport sector can drive USD 41bn economic benefits
  - Annual economic benefits of mitigation measures set out unconditional scenario rise to 5.7$bn by 2030
  - Cumulative quantified benefits over the period of USD 41.2bn (NGN 17tr)
  - Fuel savings account for the largest economic benefits, followed by reduced congestion and air pollution health impact.

4.0 Agricultural and LULUCF Sector

4.1 Review of Climate Policies and Measures at National Level

The agricultural sector consists of a series of policies that are highlighted and reviewed below.

National Agricultural Technology and Innovation Plan (NATIP)[3].

The Plan adopted a mix of short-term and medium-term multi-stakeholder approach towards ensuring resilience, recovery, and growth and, at the same time, achieving a shift from subsistent farming into a modern agriculture capable of creating massive jobs and wealth. Indeed, there are numerous challenges that prevent the Nigerian agricultural sector from attaining its full potential. Thus, the plan acknowledges certain specific constraints that must be overcome.

Components of NATIP

- Generation and promotion of appropriate technologies, research and innovations for production, processing and marketing of crops, fisheries, and livestock
- Establishment of a mega agency to address agricultural funding inadequacies
- Reviving and strengthening extension service delivery
- Increasing access to agricultural finance and promotion of agricultural insurance scheme
- Promotion of Climate Smart Agriculture (CSA) and Organic Agriculture for improved income and agricultural productivity
- Increasing access to agricultural land and productivity enhancement
- Developing value chains of key crops and livestock enterprises.
- Improving food and nutritional security.
- Increasing the competitiveness of agricultural products in local and international markets.
- Creating an enabling environment for agricultural investment and,
- Improving the livelihoods of rural dwellers and building rural economic resilience

4.1.1 The Agriculture Promotion Policy (2016 – 2020)[4]

The Agriculture Promotion policy makes specific reference to social and environmental issues in agricultural development. Under the Productivity Enhancements theme, the policy refers to issues such as access to land and land management, soil fertility, pest and disease, youth and women, and climate-smart agriculture.

Policy thrusts for Climate Smart Agriculture include:

- Boosting public awareness through advertising of the importance of climate-smart agriculture
- The management of land, water, soil, and other natural resources will be improved
- Institutional linkages and partnerships will be strengthened for ensuring climate-smart agricultural governance, policies, legislation, and financial mechanisms
- The environmental impact assessment will be carried out on major agricultural projects
- the use of renewable energy will be promoted with the involvement of the private sector
- Broad public and stakeholder awareness on Climate Smart Agriculture will be created

[3] FMARD National Agricultural Technology and Innovation Plan 2021-2024

[4] http://fmard.gov.ng/publications/downloads/green-alternative/

- The government will facilitate a soil map to improve land use and management practices
- The government will increase the adoption of global best practices on climate change, including the aspects of adaptation, mitigation, and carbon credit.

4.1.2 National Economic Empowerment and Development Strategy (NEEDS).

National Economic Empowerment and Development Strategy (NEEDS) was initiated by Olusegun Obasanjo in 1999. The key elements of this development strategy included poverty eradication, employment generation, wealth creation, and value reorientation. Its activities with States Economic Empowerment and Development Strategies (SEEDS) would help to implement an integrated rural development programme to stem rural-urban migration. NEEDS offered farmers improved irrigation, machinery, and crop varieties (Smart Agriculture) which would help to boost agricultural productivity and tackle poverty head-on since half of Nigerian poor people are engaged in agriculture. Corruption, mismanagement, lack of accountability and proper planning hinder the Programme from attaining its full potential.

4.1.3 National Fadama Development Project (NFDP)

The first National Fadama Development Project (NFDP-1) was designed in the early 1990s to promote simple, low-cost improved irrigation technology under World Bank financing. The program covered the twelve states of Adamawa, Bauchi, Gombe, Imo, Kaduna, Kebbi, Lagos, Niger, Ogun Oyo, and Taraba including the Federal Capital Territory (FCT). NFDP adopted community-driven development (CDD) approach with extensive participation of the stakeholders. This approach is in line with the policies and development strategies that emphasize poverty reduction, private sector leadership and beneficiary participation. The pitfall of the program was that the land reform act/decree has been criticized the most as what highly placed officers used to usurp land that belonged to poor people.

4.1.4 National Forest Policy[5]

The overall objective of the national forest policy is to achieve sustainable forest management that would ensure sustainable increases in the economic, social, and environmental benefits from forests and trees for present and future generations including the poor and vulnerable groups.

Non-Timber Forest Products: The concern for Non-Timber Forest Products (NTFP) in the Forestry policy is to promote the development and conservation of NTFPs in all the ecological zones for the benefits of the present and future generations and to increase NTFP's contribution to the national economy. The specific objectives are to: promote community partnership in NTFPs management; and mobilize the community for sustainable management, and multiplication, packaging, and marketing of NTFPs.

4.1.5 National Conservation Strategy (NCS)[6]

The NCS is to ensure a strategic approach to addressing environmental and natural resource issues to guarantee sustainable benefits to the greatest number of people. The aim is to manage the ecosystems in such a way that they yield the greatest sustainable benefit to present generations while maintaining the potential to meet the needs and aspirations of future generations in such a way that essential ecological processes and life support

[5] http://www.fao.org/forestry/15148-0c4acebeb8e7e45af360ec63fcc4c1678.pdf
[6] Federal Department of Forestry (1986) *National Conservation Strategy*.

systems are maintained. The strategy focuses on the main biological resources, including vegetation and forage, water, marine and fisheries, wild animals, and soil.

4.1.6 National Biodiversity Strategy and Action Plan (NBSAP)[7]

The goals and objectives are to conserve and enhance the sustainable use of the nation's biodiversity resources and to integrate biodiversity-planning considerations into national policy and decision making and the Green Agenda of Nigeria's Vision 2010. It highlighted various measures at national, state and LGA levels as well as roles for the private sector in combating desertification and other environmental problems and mainstream sustainable developmental issues into national plans and programmes.

4.1.7 National Policy on the Environment (Revised 2016)[8]

The goal of the National Policy on the Environment is to "*ensure environmental protection and the conservation of natural resources for sustainable development*". Its strategic objective is to coordinate environmental protection and natural resources conservation for sustainable development. This goal will be achieved by the following strategic objectives:

- securing quality of environment adequate for good health and well-being.
- promoting sustainable use of natural resources and the restoration and maintenance of the biological diversity of ecosystems.
- promoting an understanding of the essential linkages between the environment, social and economic development issues.
- encouraging individual and community participation in environmental improvement initiatives.
- raising public awareness and engendering a national culture of environmental preservation; and building partnership among all stakeholders, including government at all levels, international institutions, and governments, non-governmental agencies, and communities on environmental matters.

4.2 Qualitative Assessment of Policies and Measures

4.2.1 Mitigation Goals from Policies

Agriculture and forests are part of the country's natural capital that provides a direct source of income and employment for a large proportion of Nigeria's people. The sector is highly vulnerable to climate change but was also responsible for about 67% of national emissions as of 2015. Emissions from the livestock sector in Nigeria increased significantly from 21,877 Gg CO_2-eq in 2000 to 29,375 Gg CO_2-eq in 2015, which represented an increase of about 34%[9].

A major challenge when increasing agricultural production is minimizing GHG emissions associated with production. Agricultural production is a biological process from which the production of Methane and Nitrous Oxide are direct consequences. The production of ruminant livestock leads to direct Methane emissions and Nitrous oxide arises from the use of fertilizers and management of manures. The challenge is to adopt practices

[7] https://www.cbd.int/doc/world/ng/ng-nbsap-01-en.doc
[8] http://www.environment.gov.ng/publications/REVISED-NATIONAL-POLICY-ON-THE-ENVIRONMENT-FINAL-DRAFT.pdf
[9] Third National Communication

that optimize production while minimizing GHG emissions; thereby reducing carbon intensity. Strengthening climate-smart and gender-responsive approaches in the agricultural system is necessary to minimize GHG emissions and enhance the resilience of the sector. Figure 1 below shows the key elements in the GHG mitigation planning process.

Figure 6: Key element in GHG mitigation planning process

Policy Measures

- Reduce forest loss and degradation
- Increase the use of alternative domestic fuel to replace fuelwood in rural areas
- Increase soil carbon sequestration in agricultural lands
- Increase livestock productivity through improved grazing and feeding management and management of feed crop production
- Improve genetics in the dairy herd
- Promote wide adoption of climate-smart and ecologically resilient agricultural practices among small-holder farmers, including women and youth
- Document and promote the use of appropriate indigenous knowledge and best practices for climate-resilient cropping and livestock systems
- Promote agroforestry, reforestation, and afforestation, including community-based forest management and recovery
- Increase the country's network of forest reserves and conservation areas
- Protect the forest and land tenure and resource rights as well as ensure gender-equitable, inclusive, and transparent benefit-sharing
- Enhance public and private investment in the agriculture and forestry sector

Policy Measures for Adaptation

- Promote efficient, gender-responsive, socially inclusive, and climate-smart crop production, fishery, and livestock development practices
- Promote and support effective research and knowledge development and management to connect farmers, policymakers, businesses, and researchers to adapt to dynamic current and future climates scenarios
- Develop and apply improved production and risk management technologies in agriculture
- Increase the uptake of adaptation measures at farm and community levels
- Reinvigorate extension services, capacity building and technology transfer approaches to provide support to a wider group of farmers, including women and youth
- Strengthen indigenous knowledge-based adaptation measures
- Facilitate an enabling environment for enhanced public and private sector participation and financial investments to achieve adaptation at scale
- Increase access to adaptation finance through economic incentives and value chain initiatives
- Strengthen regulatory and institutional capacity to implement and disseminate technical solutions in adaptation to agriculture

4.2.2 Gaps in Existing Policies and Measures

Various gaps have been identified in the policies reviewed, highlighted below in Table 19 are the gaps found in these policies.

Table 19: Gaps found in policies in the AFOLU sector

Polices	Identified gaps
• National Agricultural Technology and Innovation Plan 2021-2024	• Lack of indicators for tracking policy progress • Technology gap • Funding gap
• National Fadama Development Project (NFDP)	• Climate mitigation actions not mainstreamed into policy design. • Lack of proper institutional framework and alignment of government priorities • Lack of valid legal framework to back up policy implementation • Poor resource allocation framework • Policy dependent on external funding support (donors) • Lack of strong political which is necessary for policy implementation • Knowledge gap • Technology gap
• National Economic Empowerment and Development Strategy (NEEDS)	
• National Policy on the Environment (Revised 2016)	
• National Conservation Strategy (NCS)	

Polices	Identified gaps
• Agriculture Promotion Policy 2016 – 2020	• Lack of awareness
• National Forest Policy	• Weak institutional capacity • Lack of strong political will necessary for policy implementation • Knowledge gap • Technology gap • Lack of awareness
• Nigerian REDD++ Strategy	• Weak institutional capacity • Lack of strong political-will necessary for policy implementation • Knowledge gap • Technology gap • Lack of awareness

4.2.3 NDC Mitigation Measures

The updated NDC reveals key priority areas for the sector that has key mitigation potential, and these includes

Table 20: Mitigation Measures in the AFOLU sector

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

Table 21: Description of Climate Smart Agriculture Mitigation Measure

Name	Climate-Smart Agriculture (CSA)
Type of instrument	Policy (sector included in economy-wide mitigation contribution)
Description	Aims to sustainably increase agricultural productivity and support equitable increases in farm incomes, enhancing food security and development
Objectives	The objective is to increase sustainable food production by 2030
Status	Ongoing
Sectors Affected	AFOLU
Gas Affected	CO_2, CH_4, N_2O
Start Year of Implementation	
Implementing Entities	Federal Ministry of Agriculture and Rural Development (FMARD), State Ministries of Agriculture
Methodologies and assumptions to estimate GHG emission reductions	IPCC methodology
Achieved GHG emission reductions	Not Available
Expected GHG Emissions Reductions	262,500 ktCO2-eq
Non-GHG Mitigation Benefits	Job creation, food security and improved standard of living

Table 22: Description of Aeration of Rice Paddy Fields (AWD) Mitigation Measure

Name	Aeration of Rice Paddy Fields (AWS)
Type of instrument	Sectoral GHG Target
Description	Aims at increasing nationwide adoption of alternated wetting and drying practices in rice-producing zones
Objectives	The objective is to ensure the adoption of AWD in rice production. 50% of cultivated land adopt AWD management system by 2030
Status	Ongoing
Sectors Affected	AFOLU
Gas Affected	CH_4
Start Year of Implementation	
Implementing Entities	Federal Ministry of Agriculture and Rural Development (FMARD), State Ministries of Agriculture
Methodologies and assumptions to estimate GHG emission reductions	IPCC methodology
Achieved GHG emission reductions	Not Available

Name	Aeration of Rice Paddy Fields (AWS)
Expected GHG Emissions Reductions	65, 281 ktCO2-eq
Non-GHG Benefits	Job creation, food security and improved standard of living

Table 23: Description of Reduction of Open field Burning of Crop Residue Mitigation Measure

Name	Reduction of Open Field Burning of Crop Residues
Type of instrument	Sectoral GHG Target
Description	Reduction of Open Burning of crop residues
Objectives	The objective is to reduce the open burning practice. 50 % reduction in the fraction of crop residues burnt by 2030
Status	Ongoing
Sectors Affected	AFOLU
Gas Affected	CO_2, CH_4, N_2O
Start year of implementation	
Implementing Entities	Federal Ministry of Agriculture and Rural Development (FMARD), State Ministries of Agriculture
Methodologies and assumptions to estimate GHG emission reductions	IPCC methodology
Achieved GHG emission reductions	Not Available
Expected GHG Emissions Reductions	10, 852 ktCO2-eq
Non-GHG Benefits	Reduce environmental waste and improve the standard of living

Table 24: Forest Restoration Mitigation Measure

Name	Forest Restoration
Type of instrument	Sectoral GHG Target
Description	Restoration of degraded forests
Objectives	The objective is to restore degraded forests in the selected ecological zones. 99,640ha of degraded forest restored.
Status	Ongoing
Sectors Affected	LULUF
Gas Affected	CO_2,
Start Year of Implementation	

Name	Forest Restoration
Implementing Entities	Federal Ministry of Environment Department of Forestry, State Departments of Forestry, National Park Service, Forestry Research Institute of Nigeria
Methodologies and assumptions to estimate GHG emission reductions	IPCC methodology
Achieved GHG emission reductions	
Expected GHG Emissions Reductions	
Non-GHG Benefits	Community resilience, availability of forest resource and improved livelihood

Table 25: Improved Natural Forest Management Mitigation Measure

Name	Improved Natural Forest Management
Type of instrument	Sectoral GHG Target
Description	Improved Management of Forests using Nature-based Solutions
Objectives	The objective is to improve the management of forests using nature-based solutions. 108,305ha of natural forests under natural management.
Status	Ongoing
Sectors Affected	LULUF
Gas Affected	CO_2,
Start of Implementation	Ongoing
Implementing Entities	Federal Ministry of Environment Department of Forestry, State Departments of Forestry, National Park Service, Forestry Research Institute of Nigeria
Methodologies and assumptions to estimate GHG emission reductions	IPCC methodology
Achieved GHG emission reductions	
Expected GHG Emissions Reductions	
Non-GHG Benefits	Community resilience, availability of forest resource and improved livelihood

Table 26: Increased Forest Protection

Name	Increased Forest Protection
Type of instrument	Sectoral GHG Target
Description	Increased projection of Forests in selected geopolitical zones
Objectives	The objective is to Increase the area of forest protected under national and subnational laws in selected geopolitical zones to 46,219ha by 2030
Status	Ongoing
Sectors Affected	LULUCF
Gas Affected	CO_2,
Start Year of Implementation	
Implementing Entities	Federal Ministry of Environment Department of Forestry, State Departments of Forestry, National Park Service, Forestry Research Institute of Nigeria
Methodologies and assumptions to estimate GHG emission reductions	IPCC methodology
Achieved GHG emission reductions	
Expected GHG Emissions Reductions	
Non-GHG Benefits	Community resilience, availability of forest resource and improved livelihood

Table 27: Reduced Fuelwood Harvest Mitigation Measure

Name	Reduced Fuelwood Harvest
Type of instrument	Sectoral GHG Target
Description	Reduce the number of hectares harvested for fuel
Objectives	The objective is to reduce the number of the harvested area used as fuelwood.
Status	Ongoing
Sectors Affected	LULUF
Gas Affected	CO_2,
Start Year of Implementation	
Implementing Entities	Federal Ministry of Environment Department of Forestry, State Departments of Forestry, National Park Service, Forestry Research Institute of Nigeria
Methodologies and assumptions to estimate GHG emission reductions	IPCC methodology

Name	Reduced Fuelwood Harvest
Achieved GHG emission reductions	
Expected GHG Emissions Reductions	
Non-GHG Benefits	Community resilience, availability of forest resource and improved livelihood

Table 28: Protection and Restoration of Mangrove Forest Ecosystems Mitigation Measure

Name	Protection and Restoration of Mangrove Forest Ecosystems
Type of instrument	Sectoral GHG Target
Description	Protection and Restoration of Mangrove Forest Ecosystems
Objectives	The objective is to protect and restore Mangroves forests within the Niger Delta region. 12997ha of mangrove forests restored and protected.
Status	Ongoing
Sectors Affected	LULUF
Gas Affected	CO_2,
Start Year of Implementation	
Implementing Entities	Federal Ministry of Environment Department of Forestry, State Departments of Forestry, National Park Service, Forestry Research Institute of Nigeria
Methodologies and assumptions to estimate GHG emission reductions	IPCC methodology
Achieved GHG emission reductions	
Expected GHG Emissions Reductions	
Non-GHG Benefits	Improve recreational activity. Job creation and protect wildlife

AFOLU Sector Indicators for Tracking NDC Progress

The following list of proposed indicators for mitigation is categorized by sector and the in line with the Update NDC priorities.

Table 29: AFOLU proposed indicators for mitigation

Sector	Mitigation Measures	Objective	Indicator	Description	Remark
Agriculture	Climate Smart Agriculture (CSA)	Aims to sustainably increase agricultural productivity and support equitable increases in farm incomes, enhancing food security and development	CH_4 emissions	CH4 emissions by emission category (enteric fermentation, manure management, rice cultivation, field burning of agricultural residues)	The indicator tracks changes in the CH4 emissions reduction/increase due to livestock and soil management
Agriculture	Climate Smart Agriculture (CSA)	Aims to sustainably increase agricultural productivity and support equitable increases in farm incomes, enhancing food security and development	N_2O emissions	N2O emissions by emission category (manure management, agricultural soils, field burning of agricultural residues)	The indicator tracks changes in the N2O emissions reduction/increase due to livestock and soil management
Agriculture	Climate Smart Agriculture (CSA)	Aims to sustainably increase agricultural productivity and support equitable increases in farm incomes, enhancing food security and development	Synthetic nitrogen fertilizers applied	Change in the applied amount of synthetic nitrogen fertilizers (%)	The indicator tracks changes in the N2O emissions reduction/increase due to synthetic nitrogen fertilizers use.
Agriculture	Climate Smart Agriculture (CSA)	The objective is to ensure the adoption of AWD in rice production. 50% of cultivated land adopt AWD management system by 2030	Rice cultivated area	Area (ha) by several conditions, e.g., ecosystem rice/water regime/type of seeding, changes of surface (%) concerning a base year/base period/baseline	The area subject to each management practice is needed since each management practice is linked to a specific set of parameters indicated in the IPCC guidelines and therefore driving the estimation process. The indicator allows the estimate of CH4 emissions from rice cultivation. The indicator helps track changes of the

Sector	Mitigation Measures	Objective	Indicator	Description	Remark
					CH4 emissions reduction due to the use of cultivation/irrigation techniques other than the conventional continuously flooded rice practice.
Agriculture	Climate Smart Agriculture	The objective is to increase sustainable food production by 2030	Anerobic Digestion	Number and installed power generation capacity of digesters fed with animal manure (MW)	The indicator is correlated to the reduction of CH4 emissions from manure management
Agriculture	Reduction of Open Field Burning of Crop Residues	The objective is to reduce the open burning practice. 50 % reduction in the fraction of crop residues burnt by 2030	No residue burning (Burial of crop residues)	Annual area of cropland subject to the activity, for types of crop (ha)	Management practice correlated with the potential increase of soil organic carbon and nitrogen content. Effects depending on temperature and humidity.
LULUCF	Forest Restoration	The objective is to restore degraded forests in the selected ecological zones. 99,640ha of degraded forest restored	Land covered by forests	Area (ha), number of trees or changes of surface (%) concerning a base year/ base period/baseline	The indicator is key in estimating CO2-eq removals and will be used to track NDC progress and achievement (e.g., millions of trees, hectares of forest area). The activity is also linked to the Nigerian REDD+ activities. In 2018, the AFOLU sector contributed 25% of the Nigeria emission as contained in the updated NDC.

Sector	Mitigation Measures	Objective	Indicator	Description	Remark
					However, the forest sector in 2016 accounted for about 32 million $tCO_{2eq.}$
LULUCF	Protection and Restoration of Mangrove Forest Systems	The objective is to protect and restore Mangroves forests within the Niger Delta region. 12997ha of mangrove forests restored and protected.	Afforestation/Reforestation, Land converted to forest land	Annual afforested/reforested land area (ha), changes of surface (%) concerning a base year/base period/baseline, or number of planted trees	The indicator is key in estimating CO2-eq removals and will be used to track NDC progress and achievement (e.g. millions of trees, hectares of forest area). The activity is also linked to the REDD+ activities. In 2018, the AFOLU sector contributed 25% of the Nigeria emission as contained in the updated NDC. However, the forest sector in 2016 accounted for about 32 million $tCO_{2eq.}$
LULUCF	Increased Forest Protection	The objective is to Increase the area of forest protected under national and subnational laws in selected geopolitical zones to 46,219ha by 2030	Enhancement/conservation of forests carbon stocks	Annual change in biomass carbon stock (tC/ha), or another equivalent unit	The indicator is key in estimating CO2-eq removals. The activity is also linked to the REDD+ activities.
LULUCF	Improved Forest Management	The objective is to improve the management of forests using nature-based solutions. 108,305ha of natural forests under natural management.	Sustainable management of forests	Area (ha), changes of annual surface (%)	The indicator is key in estimating CO2-eq removals. The activity is also linked to the REDD+ activities.
LULUCF	Reduced Fuel Wood Harvest	The objective is to reduce the number of the harvested area used as fuelwood	Harvested fuelwood (biomass)	Annual volume (m3) or annual biomass (t)	The indicator is key in estimating CO2-eq emissions and removals.

Table 30: AFOLU Sector NDC Mitigation Actions and Tracking Measures

Sector	Mitigation Measures	Data Source	Tracking Measures
Agriculture	Climate Smart Agriculture (CSA)	NBS, FMARD, FAOSTAT, State Department of Agriculture Other national and international publications	Annual Crop Production in tonnes per Annum, Animal population, Annual Urea Consumption Figures, Annual Generic NPK Consumption Figures, Fractions of manure, management practices
Agriculture	Aeration of Rice Paddy Fields (AWD) Mitigation Measure	NBS, FMARD, FAOSTAT, State Department of Agriculture Other national and international publications	Area (ha) by several conditions, e.g. ecosystem rice/water regime/type of seeding, changes of surface (%) with respect to a base year/base period/baseline
Agriculture	Reduction of Open Field Burning of Crop Residues	NBS, FMARD, FAOSTAT, State Department of Agriculture, Other national and international publications	Annual area (ha)
LULUCF	Forest Restoration	Federal Department of Forestry Report, Forestry Research Institute Report, FMEV, UNDP REDD++ reports	Annual afforested/reforested land area (ha), changes of surface (%) with respect to a base year / base period / baseline, or number of planted trees
LULUCF	Protection and Restoration of Mangrove Forest Systems	Federal Department of Forestry Report, Forestry Research Institute Report, FMEV, UNDP REDD++ reports, State Department of Forestry	Area (ha), changes of annual surface (%) Annual change in biomass carbon stock (tC/ha), or another equivalent unit
LULUCF	Increased Forest Protection	Federal Department of Forestry Report, Forestry Research Institute Report, FMEV, UNDP REDD++ reports, State Department of Forestry	Area (ha), changes of annual surface (%)
LULUCF	Improved Forest Management	Federal Department of Forestry Report, Forestry Research Institute Report, FMEV, UNDP REDD++ reports, State Department of Forestry	Area (ha), changes of annual surface (%)
LULUCF	Reduced Fuel Wood Harvest	Federal Department of Forestry Report, Forestry Research Institute Report, FMEV, UNDP REDD++ reports, State Department of Forestry	wood and paper products such as furniture, construction material, plywood, wood-based panels, and paper from harvested forests within the country

5.0 Conclusion

The ability to effectively measure, report, and address GHG emissions is dependent on the adaptation and implementation of the policies. Over the years, several policies and measures have been indicated by the government to enhance the national objective of addressing the impact of climate change. This report has successfully reviewed the available policies and measures across the various sectors. The objective of reviewing the existing policies and measures is to be able to develop NDC indicators that are required to track the progress of NDC implementation in the country.

Hence, for this report, the existing policies; inclusive of the updated NDC- applicable to the various priority sectors, were assessed. The assessment of these existing policies across the NDC priority sectors (Oil & Gas, Road Transport, OTS, Agriculture, and LULUCF), played a vital role in developing the relevant indicators and tools as contained in this report that are needed in tracking the country's progress towards the implementation and achievement of its NDC. While typical indicators have been developed across the principal NDC sectors for monitoring progress, one of the key findings of the report is the fact that some sectors are far ahead of others in terms of actual policy development and implementation that could drive the NDC ambition. The implication of this is that the indicators developed vary by sector, and the NDC progress may differ at the sector level.

Nevertheless, the assessment of the existing sectoral P&M (both qualitative and quantitative) from the various NDC sectors will provide a good future reference for monitoring the progress of the country's NDC ambition. Also, the indicators and tools developed will provide the sector experts and all relevant stakeholders with the required methodology to ensure that progress is not only monitored but NDC indicators can be improved upon on an ongoing basis.

Going forward, the GHG emissions achieved, and targets should be monitored sectorally and reported both on a sectoral and national basis.

References

7 Big Wins; Retrieved from www.7Bigwins.com

Analysis of Policy Documents, 2012 change in Nigeria (Final Draft) Sept 2010.

Department of Environment (1998), "Integrated Transport White Paper: A new Deal for Transport", London UK, Transport and Regions.

Federal Republic of Nigeria (1965), 'Statement of Policy on Transport', Government Press Lagos.

FGN/FMEnv (July 2021): Nigeria's NDC to UNFCCC, submitted 30/7/21.

FGN/FMEnv. (Aug. 2017): Sectoral Action Plans for Nigeria's Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC).

FGN/National Planning Commission: The Transformation Agenda Summary of FG's key Priorities

FMEnv (Oct 2013): Nigeria Climate Change Policy Response & Strategy retrieved from www.climate policy.data base.org

FMEnv (Sept 2010): National Environmental Economic and Development Study (NEEDS) for climate

GEF (2021): Global climate change Mitigation

Ibid: Nigeria's NDC 2021.

Ibitoye (2014): Analysis of possible flaring scenarios

ICAT (April 2016): Assessing the impact of native climate Policies and actions: new set of tools to help achieve the Paris Agreement.

ICAT (June 2021): New Release-: Proposed indicators for domestic MRV purposes and tracking of NDCS. (to improve progress reporting on NDC implementation).

ICAT Report: "Proposed indicators for domestic MRV purposes and tracking progress of NDCs"

Iledare, W. (2008), An appraisal of oil and gas industry reform and institutional restructuring in Nigeria. International Association of Energy Economics, Fourth Quarter, 23-26.

International Journal of Development and Sustainability Online ISSN: 2168-8662 – www.isdsnet.com/ijds *Volume 2 Number 2 (2013): Pages 505-520 ISDS Article ID: IJDS12122001*

IPCC (2004): Summary for Policy makers in: Climate Change 2014: Mitigation of Climate charge. Contribution of working Group III to the fifth Assessment Report of the Inter-Government Panel on Climate Change.

IPCC (May 2019): IPCC updates Methodology for GHG (full) Inventories (www.ipcc.ch)

Lisa Hanle (GHGMI (July 2017): How do we 'track' progress and 'enhance Contribution?

Michael Nachmany, et al. (2015): The 2015 Global Climate legislation Study. A Review of climate change legislation in 99 Countries.

Neelam Singh and Marion Viewmeg (WRI) (Jan 2016): Monitoring implementation and Effects of GHG mitigation policies. Steps to develop performance indicators.

New Climate Institute: Analysis of sustainable development indicators associated with mitigation measures in Nigeria's 2021 NDC update

Nigeria Facts and Figures, 2021: Retrieved from https://www.opec.org/opec_web/en/about_us/167.htm

Nigeria's First Nationally Determined Contribution (NDC) – 2021 Update

Nigerian Gas Flare Commercialization Program retrieved from https://ngfcp.dpr.gov.ng/

Nigerian Gas Masterplan retrieved from https://nnpcgroup.com/NNPC-Business/Midstream-Ventures/Pages/Nigerian-Gas-Master- Plan.aspx

OECD (2003): Institutional Capacity and Climate Activities. policies, programmes projects. 2011-2015.
Policy plans for Nigeria's road development retrieved from file:///C:/Users/HP/Desktop/RTS%20P&M%20Report/Policy%20plans%20for%20Nigeria's%20rad%20development.html

Prasad V.S.N Tallapragada, April 2009; Nigeria's Electricity Sector- Electricity and Gas Pricing Barriers.

International Association for Energy Economics Sources of Green House Gas Emissions, 2019: Retrieved from: https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions

Ranping Song (NOV 2014): Indicators: What are develop for what?

UNFCCC (2021): Guiding Principles for MPGs.

UNFCCC (2021): Katowice Climate Package: Making the Paris Agreement Work for all.

UNFCCC (June 2020): Preparing for Implementation of the Enhanced Transparency Framework under the Paris Agreement. Technical Handbook for developing country Parties. First Edition.

US. EPA (July 2021): GHG Inventory Development Process and Guidance.

WRI (2021): Climate watch 2021. Data explorer.