Operational Guidelines for Tracking and Reporting Nigeria's Nationally Determined Contributions (NDC)

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Abbreviation

BAU	Business-As-Usual
BR	Biennial Report
BTR	Biennial Transparency Report
CBIT	Capacity-Building Initiative for Transparency
CMA	Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement
CNG	Compressed Natural Gas
CO2	Carbon Dioxide
CO2eq / CO2-e	Carbon Dioxide Equivalent
COP	Conference of the Parties
CTF	Common Tabular Formats
DAPPMAN	Depot and Petroleum Products Marketers Association of Nigeria
DCC	Department of Climate Change
ETF	Enhanced Transparency Framework
FMARD	Federal Ministry of Agriculture and Rural Development
FMEnv	Federal Ministry of Environment
GHG	Greenhouse Gas
GST	Global Stocktake
HFCs	Hydrofluorocarbons
IGCCMA	Intergovernmental Committee on Carbon Market Activation
IOCs	International Oil Companies
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
ITMO(s)	Internationally Transferred Mitigation Outcome(s)
kt	Kilotons
LEDS / LT-LEDS	Long-Term Low Emission Development Strategy
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LULUCF	Land-Use, Land-Use Change and Forestry
MAC	Marginal Abatement Cost
MDAs	Ministries, Departments and Agencies
MOMAN	Major Oil Marketers Association of Nigeria
MPGs	Modalities, Procedures and Guidelines

MRV	Measurement, Reporting and Verification
Mt	Million Tonnes
N2O	Nitrous Oxide
NA	Not Applicable
NAP	National Adaptation Plan
NCCC	National Council on Climate Change
NCCP	National Climate Change Policy
NCMF	National Carbon Market Framework
NCS	National Circumstances
NDC	Nationally Determined Contribution
NDC 3.0	Nigeria's Updated Third Nationally Determined Contribution
NF3	Nitrogen Trifluoride
NGC	Nigeria Gas Company
NID	National Inventory Data
NIR	National Inventory Report
NMDPRA	Nigeria Midstream Downstream Petroleum Regulatory Authority
NNPC	Nigerian National Oil Corporation
NOCs	National Oil Companies
NSGIM	National System for Greenhouse Gas Inventory Management
NUPRC	Nigerian Upstream Petroleum Regulatory Commission
PFCs	Perfluorocarbons
PPMC	Petroleum Products Marketing Company
QA/QC	Quality Assurance / Quality Control
REDD+	Reducing Emissions from Deforestation and Forest Degradation Plus
SDGs	Sustainable Development Goals
TACCC	Transparency, Accuracy, Completeness, Comparability, and Consistency
TER	Technical Expert Review
UNFCCC	United Nations Framework Convention on Climate Change
WAM	With Additional Measures Scenario
WEM	With Existing / Implemented Measures Scenario
WOM	Without Measures Scenario


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1.0 Introduction

Nigeria, as a Party to the Paris Agreement, has committed to taking ambitious actions to address climate change through the implementation of its Nationally Determined Contribution (NDC). The NDC represents the country's climate commitment, outlining priority mitigation and adaptation measures aimed at achieving sustainable, low-carbon development. In line with Article 13 of the Paris Agreement, which established the Enhanced Transparency Framework (ETF), Nigeria is required to regularly track, assess, and report its progress toward achieving its NDC targets. To fulfil this obligation, there is a need for a robust and standardized national system that ensures transparency, consistency, and comparability in the generation and reporting of data related to its NDC implementation.

The Operational Guidelines for Tracking and Reporting Nigeria's NDC provide a practical framework for how the country's climate commitments will be monitored, reported, and verified in a transparent and coordinated manner. The guidelines outline the institutional, methodological, and operational processes required to track progress across sectors and to report in line with international best practices. Specifically, they seek to strengthen Nigeria's institutional capacity to systematically collect, manage, and report data that demonstrate progress in implementing mitigation actions, achieving emission reductions, and fulfilling both conditional and unconditional NDC targets.

The guidelines are aligned with the Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement of the ETF and the requirements for preparing Biennial Transparency Reports (BTRs), ensuring that national efforts are compatible with global reporting obligations under the United Nations Framework Convention on Climate Change (UNFCCC). They also draw from existing national frameworks such as the Climate Change Act (2021), the National Climate Change Policy, and the Nationally Determined Contribution Implementation Framework, which collectively provide the legal and policy basis for NDC implementation and tracking in Nigeria.

Furthermore, the operational guidelines aim to address key challenges associated with fragmented data systems, weak coordination among institutions, and inconsistent methodologies for quantifying and reporting greenhouse gas (GHG) reductions. By providing step-by-step procedures, standardized templates, and clear institutional roles, the guidelines enhance accountability, promote data transparency, and ensure that information reported at both national and sectoral levels is reliable and verifiable.

The document also establishes the linkages between NDC tracking and other components of the national measurement, reporting, and verification (MRV) system, as well as the national GHG inventory system. It ensures that progress in implementing mitigation policies, actions, and measures can be effectively tracked against baseline scenarios, and that achievements are communicated in a consistent format using Common Tabular Formats (CTFs) as required under the ETF.

Ultimately, these operational guidelines will serve as a key reference document for all relevant government ministries, departments, and agencies (MDAs), as well as non-state actors involved in data generation, management, and reporting for NDC implementation.

The subsequent chapters of this report provide a detailed overview of Nigeria's NDC 3.0, outline the legal and institutional arrangements for NDC tracking, describe the methodological and operational frameworks for assessing progress, and present the step-by-step guidance for completing the reporting templates.

1.1 Objectives of the Guidelines

The specific objectives of the *Operational Guidelines for Tracking and Reporting Nigeria's NDC* are to:

1. Establish a coherent national framework for tracking and reporting progress toward Nigeria's NDC targets in alignment with the ETF.
2. Define clear institutional roles, data-sharing mechanisms, and coordination processes among key stakeholders involved in NDC implementation.
3. Provide standardized methodologies, templates, and indicators for assessing and reporting mitigation outcomes across sectors.
4. Strengthen the capacity of national institutions to produce transparent, verifiable, and high-quality data to support Biennial Transparency Reports and global stocktake processes.

2. Overview of Nigeria's NDC 3.0

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

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

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

2.1 Emissions Baseline and National Reduction Targets

Mitigation targets in Nigeria's NDC 3.0 are anchored on 2018 as the base year, with reported national emissions of 573.5 $MtCO_2e$. The NDC also marks a shift from expressing reductions relative to a BAU scenario to expressing them relative to this base-year emissions level, hence net zero is targeted at 2060 targets and absolute emissions reductions of 168.2 Mt CO2e in 2030 and 184.9 Mt CO2e in 2035 from base year 2018 towards net zero by 2060.

These economy-wide absolute emissions reductions represent 29% and 32% of net national emissions of 2018, in 2030 and 2035, respectively. Nigeria maintains its 20% unconditional objective and views

the conditional reduction at 80% of the 29% and 32% reduction of the estimated 2018 emissions in 2030 and 2035, respectively[1].

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

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

2.2 Key Mitigation Measures and Actions

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

The Energy sector comprising fuel combustion and fugitive emissions contributes over 60% of national GHG emissions. Within this sector, the NDC targets the elimination of routine gas flaring by 2030 and a 60% reduction in fugitive emissions by 2035, delivering a combined mitigation potential of 29.4 $MtCO_2e$. In the fuel-combustion component, the NDC also aims to achieve a 52% renewable energy share in national electricity generation by 2030 through expanded hydro, solar, and demand-side management investments.

In the Transport sector, the NDC introduces an ambitious plan on adoption of cleaner fuel to replace diesel with 50% of locomotives using compressed natural gas (CNG) and to transition 30% of the national vehicle fleet to electric vehicles (EVs) and 20% to compressed natural gas (CNG) systems by 2035, representing a mitigation potential of 44.3 $MtCO_2e$. These measures are supported by public transport upgrades, such as Bus Rapid Transit (BRT) systems, and urban planning reforms aimed at reducing vehicle congestion and emissions (FMEnv, 2024).

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

The Industrial Processes and Product Use (IPPU) sector focuses on improving energy and material efficiency, promoting low-carbon cement production, and introducing carbon capture and utilization (CCU) technologies. This sector contributes a mitigation potential of 14.0 $MtCO_2e$.

In the LULUCF sector, the principal goal is to reduce the national deforestation rate by 60% by 2030, with a mitigation potential of 304.8 $MtCO_2e$, complemented by afforestation and reforestation programmes with an additional 34.4 $MtCO_2e$ potential. These interventions also support biodiversity conservation, watershed protection, and rural livelihoods.

The Waste sector targets integrated waste management, recycling, composting, and landfill methane capture, contributing 12.5 $MtCO_2e$ in mitigation. The agriculture sector contributes a relatively modest 2.1 $MtCO_2e$, through the adoption of climate-smart agriculture, efficient fertilizer use, and improved livestock management practices.

2.3 Financial Requirements and Resource Mobilization

According to the NDC report, the financial requirements for implementing Nigeria's NDC 3.0 from 2026 – 2035 are estimated at US$337 billion, covering mitigation, adaptation, and Action for Climate Empowerment (ACE) components. Of this total:

- US$195 billion (57.8%) is required for mitigation measures.
- US$141.5 billion (42.1%) for adaptation programmes; and
- US$0.5 billion (0.1%) for Action for Climate Empowerment activities.

Nigeria commits to mobilizing US$67 billion (20%) domestically through public budgets, private sector investments, green bonds, and carbon markets, while seeking US$270 billion (80%) from international financial and technological partners. The NDC explicitly references the use of Internationally Transferred Mitigation Outcomes (ITMOs) under Article 6 of the Paris Agreement as potential sources of additional finance.

To strengthen transparency and accountability in mobilizing resources for NDC implementation, a **Climate Finance Tracking and MRV framework** should be established to systematically monitor climate-related financial flows. The framework will define clear climate finance categories and reporting boundaries and introduce standardized reporting templates for relevant ministries, agencies, development partners, and private sector actors. Financial flows should be tracked across key sources including public budget allocations, private sector investments, concessional finance, grants, and carbon market–related revenues to ensure comprehensive coverage and avoid double counting.

Institutional responsibilities will also be clarified, with sectoral institutions responsible for primary data reporting and a central coordinating body responsible for data consolidation, verification, and reporting. This approach will enable more effective monitoring of resources mobilized for NDC implementation while aligning national reporting practices with international climate finance transparency requirements.

2.4 Alignment with National and Global Frameworks

Nigeria's NDC 3.0 is fully integrated into the country's broader development frameworks. It supports the Medium-Term National Development Plan (MTNDP 2021–2025) and is harmonized with the Nigeria Energy Transition Plan (2022), which outlines the pathway to universal energy access and a zero-carbon economy by 2060. The NDC also operationalizes the Climate Change Act (2021), which mandates five-year carbon budgets and a national carbon trading framework.

At the international level, the NDC 3.0 adheres to the reporting requirements of the Enhanced Transparency Framework (ETF) and contributes to the Sustainable Development Goals (SDGs) notably SDG 7 (Affordable and Clean Energy), SDG 13 (Climate Action), and SDG 15 (Life on Land)[2].

[2]https://sdgs.un.org/publications/publication-aligning-nationally-determined-contributions-and-sustainable-development?utm_source

Figure 1: Sustainable Development Goals

2.5 Implications for Tracking and Reporting

The shift to an absolute emissions reduction framework anchored on the 2018 base year introduces new technical and institutional requirements for tracking progress. Future tracking and reporting efforts must therefore be directly linked to the updated GHG inventory methodologies used in the NDC 3.0 and Biennial Transparency Report (BTR) submissions.

Given the dominance of the LULUCF and energy sectors in Nigeria's mitigation profile, special emphasis will be required on enhancing forest monitoring systems, satellite-based data collection, and robust QA/QC procedures. This operational guideline defines mechanisms for tracking output indicators (such as renewable energy capacity additions or hectares of forest restored) alongside outcome indicators (quantified emission reductions in $MtCO_2e$).

Additionally, the NDC's inclusion of ITMOs and substantial international finance components underscores the necessity for integrated finance tracking and reporting frameworks to ensure that conditional commitments are accurately attributed and transparently reported in BTRs.

Table 1: Summary of Key Information in NDC 3.0

Item	Description
Target and description	Nigeria commits to 20% unconditional objective and views the conditional component at 80% of the 29% and 32% absolute reduction compared to 2018 emissions level in 2030 and 2035, respectively and net-zero emissions by 2060. These are economy-wide mitigation targets aligned with national development goals and Paris Agreement obligations.
Target year and whether Single or multi-year target	Single-year targets for 2030, 2035, 2050, and 2060.
NDC implementation period	Implementation actions and sectoral measures span 2026–2035, with a long-term roadmap to 2060.

Reference point and level	Nigeria uses a static reference-year baseline (2018) for calculating its absolute emissions reduction targets. These targets are no longer expressed as % reductions from BAU but as absolute $MtCO_2e$ reductions from the 2018 level, consistent with the GST recommendations.
Reference to the inventory edition used to determine NDC target	Based on Nigeria's National GHG Inventory (2015–2021) prepared under BTR1 (2024). This updated inventory is the basis for BAU trajectories and target calculations.
Sectors and categories covered	Covers all five IPCC sectors: Energy (fuel combustion & fugitive), IPPU, Agriculture, LULUCF, and Waste. Nigeria expanded coverage to 19 IPCC categories in NDC 3.0.
Greenhouse gases covered	CO_2, CH_4, N_2O, and HFCs. PFCs, SF_6, NF_3 identified for future consideration as capacity improves.
Methods: IPCC inventory methodologies	Based on IPCC 2006 Guidelines, 2013 Wetlands Supplement, and 2019 Refinement.
Methods: Global warming potential (GWP) values	Nigeria applies IPCC AR5 GWP values, consistent with Paris Agreement transparency requirements.
Baseline scenario targets: Static or dynamic baseline scenario	Nigeria uses a static reference-year baseline (2018) for calculating its absolute emissions reduction targets. These targets are no longer expressed as % reductions from BAU but as absolute $MtCO_2e$ reductions from the 2018 level, consistent with the GST recommendations.
Business as usual (BAU) scenario targets: Projection method	BAU projections derived from the updated national inventory, sector-specific modelling, and IPCC-consistent methodologies. NDC 3.0 does not use the old BAU percent-reduction format from previous NDCs; instead, it employs a new BAU trajectory with annual projections
Approach to analysis of mitigation potential	Mitigation potentials estimated using IPCC methodologies, updated sector data, and expert assumptions. IPCC 2006 software was used for quantifying mitigation potentials and compiling national estimates.
GHG reduction: global level, sectoral level	With the transition from an emission reduction % relative to the BAU scenario to an economy-wide absolute emissions reduction as recommended by the GST, Nigeria is now targeting net zero by 2060. Intermediate targets are absolute emissions reductions of 168.2 Mt CO2 e in 2030 and 184.9 Mt CO2 e in 2035 from base year 2018 towards net zero by 2060. Nigeria NDC 3.0 sets an economy-wide reduction target. 20% unconditional objective and views the conditional reduction at 80% of the 29% and 32% reduction of the estimated 2018 emissions in 2030 and

	2035, respectively. Sectoral Level: LULUCF sector (73.7%) will contribute the most in terms of absolute emissions reduction followed by the Energy sector (including buildings and transport) (22.0%), IPPU (2.0%), Waste (1.9%), and Agriculture (0.4%). The order stays the same in 2035 with LULUCF at the top (68.1%), followed by Energy (including buildings and transport) (26.3%), IPPU (2.7%), Waste (2.5%) and Agriculture (0.4%). LULUCF provides the highest mitigation potential (73.7%), followed by Energy, Agriculture, IPPU, and Waste (as detailed in NDC mitigation tables).
Intention to use Article 6 mechanisms to achieve NDC targets	Yes. Nigeria intends to use voluntary cooperation under Article 6, and is developing an ITMO framework, carbon registry, and Manual of Procedures, and may transition eligible CDM projects into Article 6 mechanisms.

3. Overview of ETF reporting requirements related to tracking progress of NDC

The Enhanced Transparency Framework (ETF) established under *Article 13 of the Paris Agreement* provides the universal mechanism through which Parties monitor, report, and verify progress in implementing and achieving their NDCs. It represents the operational backbone of the Paris Agreement's accountability system, ensuring comparability, accuracy, and credibility of climate data submitted by Parties to the UNFCCC.

For Nigeria, which ratified the Paris Agreement in 2017 and subsequently enacted the Climate Change Act (2021), the ETF forms the foundation for institutionalizing a transparent and verifiable reporting system that can credibly demonstrate progress towards its updated NDC 3.0 targets.

This chapter provides a comprehensive overview of ETF reporting requirements and their practical relevance for Nigeria. It outlines how international modalities and procedures translate into national obligations under the country's legal and institutional frameworks, including the *Climate Change Act (2021)*, the *National Climate Change Policy (NCCP) 2021–2030*, and Nigeria's *Long-Term Low Emission Development Strategy (LT-LEDS)*. It also identifies the mechanisms, data systems, and institutional arrangements required to align Nigeria's domestic MRV structures with the ETF.

3.1 Understanding the Enhanced Transparency Framework

The Enhanced Transparency Framework is the evolution of the former Measurement, Reporting, and Verification (MRV) system under the UNFCCC. Unlike the earlier MRV system, which applied different obligations to Annex I and non-Annex I Parties, the ETF establishes a unified yet flexible reporting framework applicable to all countries (UNFCCC, 2018).

Article 13 of the Paris Agreement mandates all Parties to regularly provide information necessary to:

(a) greenhouse gas emissions and removals
(b) track progress in implementing and achieving their NDCs;
(c) report on adaptation actions; and
(d) communicate information on financial, technological, and capacity-building support provided or received.

The ETF is therefore both an accountability mechanism and a learning instrument. The provision in the ETF allows the global community to assess collective progress under the *Global Stocktake (GST)*, while enabling each Party to evaluate the effectiveness of its own climate actions.

For Nigeria, the ETF provides a structured opportunity to consolidate data from diverse sectors energy, agriculture, waste, industry, and land use into a unified national reporting framework. The NCCC serving as the UNFCCC national focal point, has progressively developed national systems such as the National System for Greenhouse Gas Inventory Management (NSGIM) to facilitate ETF-aligned reporting.

The ETF is guided by the principles of Transparency, Accuracy, Completeness, Comparability, Consistency, (TACCC) and continuous improvement. These principles serve as operational criteria for all reporting processes and data systems (UNFCCC, 2018).

For Nigeria, these principles are embedded within domestic frameworks such as the *Climate Change Act (2021)*, which mandates the establishment of a NCCC manage climate data, track progress, and report on national emission reductions. Transparency and accuracy are critical for ensuring that data on mitigation measures such as gas flare reduction, renewable energy deployment, and afforestation can be independently verified.

Completeness and comparability require that Nigeria's GHG inventory cover all relevant sectors consistent with the 2006 IPCC Guidelines and the 2019 Refinements, ensuring uniformity with international methodologies. Consistency and continuous improvement further compel Nigeria to maintain coherent time-series data and progressively upgrade its analytical capabilities through improved data collection, QA/QC, and capacity development.

3.2 ETF Modalities, Procedures, and Guidelines (MPGs)

The operational rules for ETF implementation are contained in Decision 18/CMA.1, adopted at COP 24 in Katowice. These *Modalities, Procedures, and Guidelines (MPGs)* provide the foundation for Parties' reporting obligations.

Nigeria, just like other developing countries who are Parties to Paris Agreement, are required to submit Biennial Transparency Reports (BTRs) beginning in December 2024. Each BTR must contain:

I. National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases

II. Information necessary to track progress made in implementing and achieving nationally determined contributions

III. Information related to climate change impacts and adaptation

IV. Information on financial, technology development and transfer and capacity building support provided and mobilized

V. Information on financial, technology development and transfer and capacity building support needed and received

VI. Information to be reported when national communications and biennial transparency reports are submitted jointly every four years

VII. Information on flexibility

VIII. Improvements in reporting overtime

IX. Any other relevant information

Annexes

- Annex 1: Technical annexes for 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

The MPGs also mandate that each Party establish an institutional arrangement for data collection, QA/QC, and archiving. Nigeria's institutional readiness is demonstrated through the creation of the NCCC, which coordinates cross-sectoral climate governance. It should be noted that Nigeria submitted its First Biennial Transparency Report (BTR 1) under the UNFCCC on the 26th of December 2024[3].

As regards NDC tracking, each Party is required to report in its BTR the information necessary to track progress in implementing its NDC during the implementation period and, ultimately, to demonstrate whether it has achieved its NDC. Information used to track progress of NDCs is of key importance in the ETF, since it is crucial to be able to analyse whether countries are on track to meet the objectives of

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

their national targets, and to allow the aggregated NDCs to be assessed in the global stocktake, informing countries of the subsequent NDC revision process.

This information is subject to a technical expert review (TER) by a team of expert reviewers. TERs are focused on reviewing the consistency of the reported information with the MPGs, taking into account flexibility provisions, and considering the Party's implementation and achievement of its NDC.

The MPGs provide guidance on the relevant information to be reported to describe the NDC, track the progress of its implementation and assess its achievement. The reporting obligations for tracking progress in implementing and achieving NDCs are outlined in chapter III of the MPGs and summarized in table below.

Table 2: Reporting provisions on information necessary to track progress made in implementing and achieving nationally determined contributions under Article 4 of Paris Agreement

Paragraph(s) of the MPGs	Heading	Area of flexibility under the MPGs	Format of reporting
Paragraphs 59-63	A. National circumstances and institutional arrangements	NA	Information to be reported in a narrative format
Paragraph 64	B. Description of a Party's NDC under Article 4 of the Paris Agreement, including updates	NA	Information to be reported in a narrative and common tabular format (CTF tables)
Paragraphs 65-79	C. Information necessary to track progress made in implementing and achieving a Party's NDC under Article 4 of the Paris Agreement	NA	Information to be reported in a narrative and common tabular format (CTF tables)
Paragraphs 80-90	D. Mitigation PaMs, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving an NDC under	Estimates of expected and achieved GHG emission reductions (para. 85)	Information to be reported in a narrative and common tabular format (CTF tables)

	Article 4 of the Paris Agreement		
Paragraph 91	E. Summary of GHG emissions and removals	NA	Information to be reported in a narrative and common tabular format (CTF tables)
Paragraphs 92-102	F. Projections of GHG emissions and removals, as applicable	Projections of GHG emissions and removals (paras. 92, 95 and 102)	Information to be reported in a narrative and common tabular format (CTF tables)
Paragraph 103	G. Other information	NA	Information to be reported in a narrative format

All Parties shall report information necessary to track progress made in implementing and achieving their NDC **in a narrative and common tabular format**, as applicable. As depicted in the figure below, area of flexibility under the MPGs is previewed for some of this information.

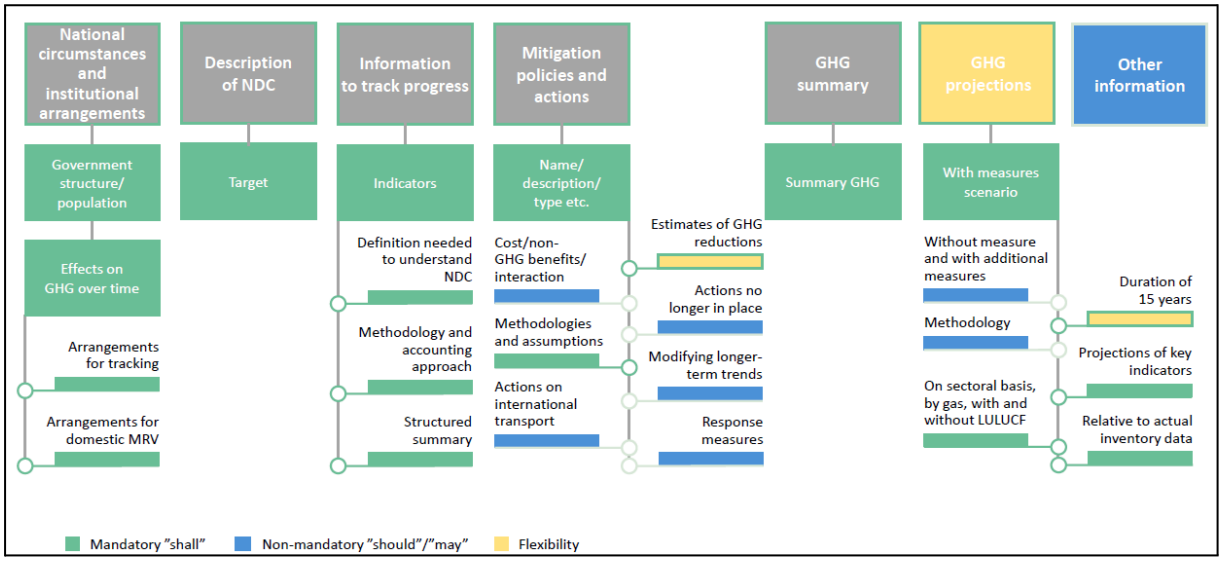


Figure 2. Tracking progress of NDC: Overview of reporting requirements (source)

Annex II to the transparency guidance contains a total of 13 tabular formats, to be used for reporting the information specified in chapter III of the MPGs - the information necessary to track progress made in implementing and achieving NDCs. Not all tabular formats need to be filled in by all Parties, and the information provided in these formats may be complemented by other formats in the BTR (narrative, figures etc.), as stated in paragraph 4 of the transparency guidance.

Figure below provides an overview of the common tabular formats for tracking progress and how they are related to the various sections and paragraphs of the MPGs.

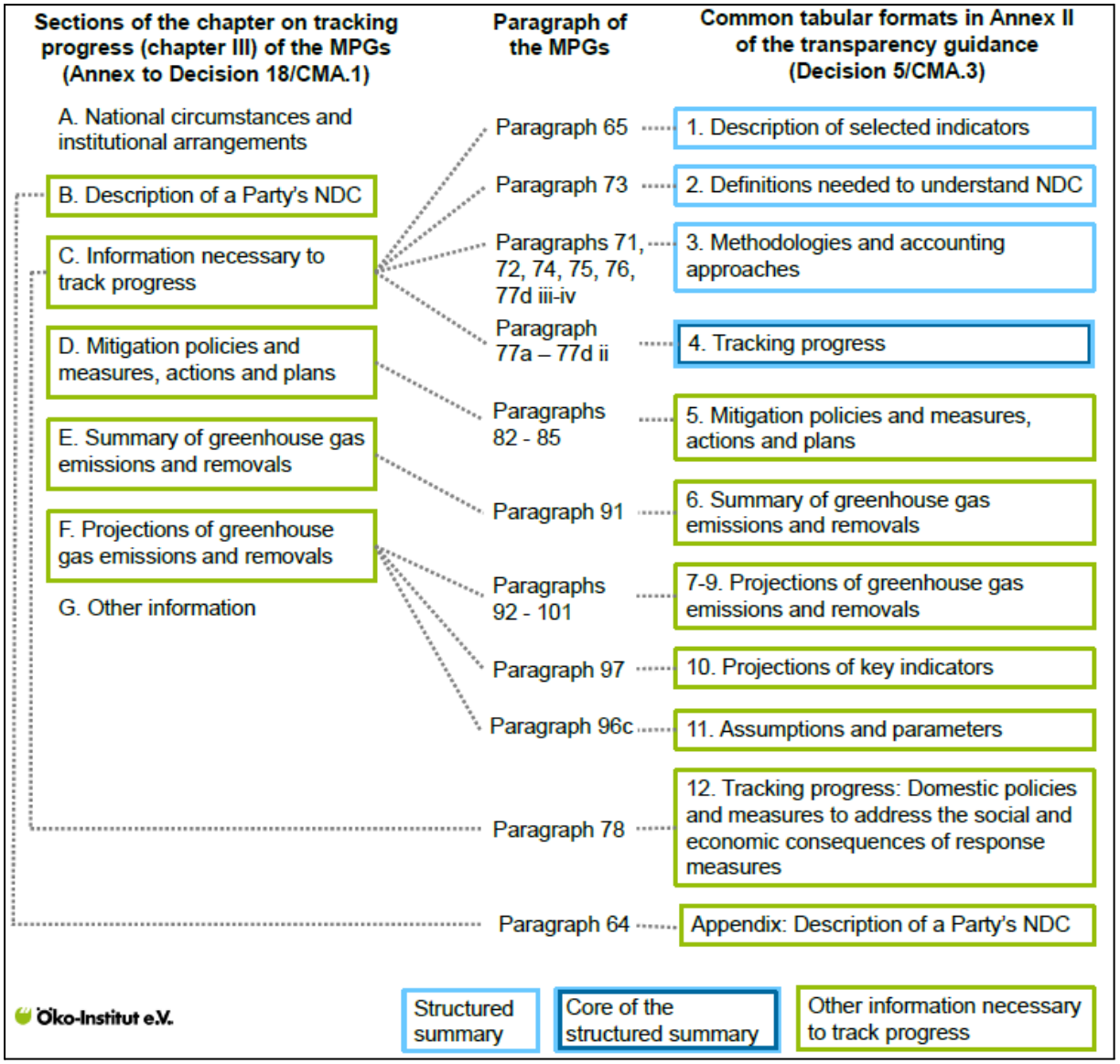


Figure 3. Overview of common tabular formats for tracking progress (source)

The first four tabular formats are known as the 'structured summary'. This is because paragraph 77 of the MPGs states that 'each Party shall provide the information referred to in paragraph 65-76 above in a structured summary […]'. The structured summary in a narrow sense, or its core, is covered by CTF 4. It addresses the specific information listed in paragraph 77.

Some reporting elements aim to understand the past and progress to date: they are backwards looking. Other reporting requirements aim to understand potential future progress: they are forward looking.

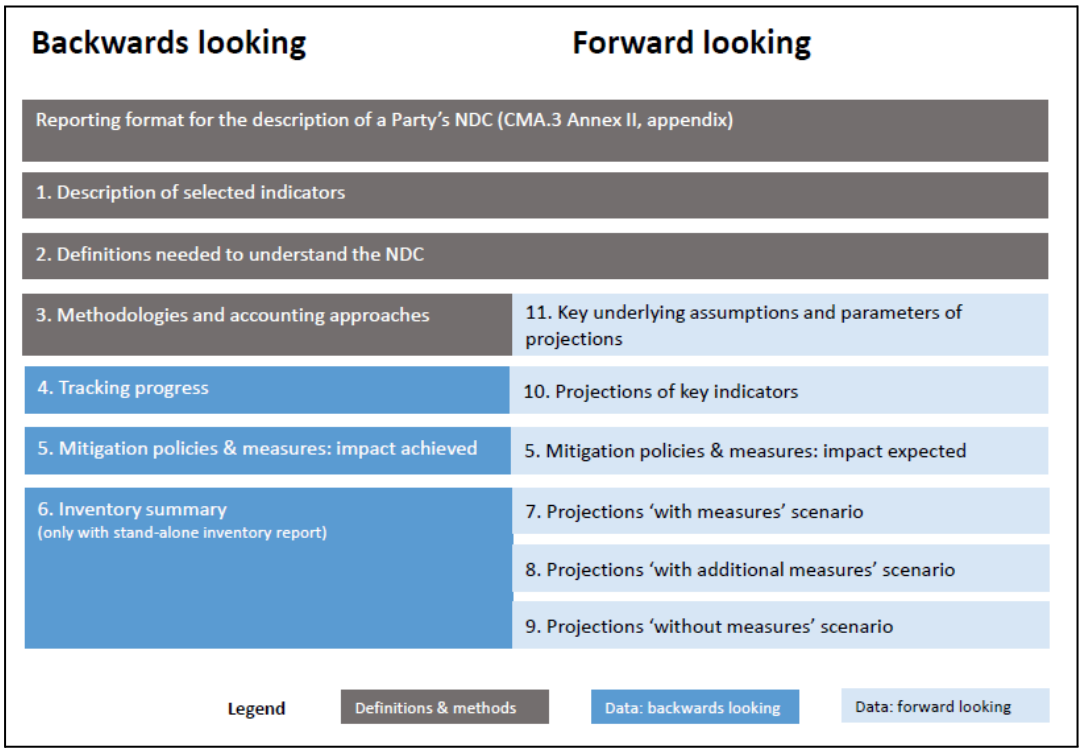


Figure 4. Understanding the perspective of requirements for the common tabular formats related to tracking progress (source)

3.3 ETF Reporting in the Nigerian Context

In Nigeria's context, the ETF aligns directly with national efforts to operationalize the Climate Change Act and the NDC 3.0 implementation plan. The NCCC, supported by development partners such as the UNDP and World Bank, has initiated steps to establish a National MRV and NDC Tracking System that integrates data from line ministries, agencies, and sectoral operators. (see section **4.2** for more details on roles and responsibilities)

These sectoral systems collectively enable Nigeria to populate the Common Tabular Formats (CTFs) required under the ETF, demonstrating practical implementation of international obligations within national systems.

Nigeria's Biennial Transparency Reports (BTRs) constitutes the primary channel for ETF reporting. Each report will integrate information from the National GHG Inventory and the NDC tracking framework. The first BTR (BTR1) represents a key milestone, serving as the inaugural mechanism through which Nigeria translates its national climate actions into the reporting framework of the ETF. Through the National MRV system, BTR1 consolidates sectoral mitigation data and national GHG inventory outputs,

thereby linking domestic climate action with international transparency requirements under the Paris Agreement.

The structured summary, a mandatory ETF component, will present Nigeria's progress toward its NDC 3.0 targets in tabular form. It will include indicators such as total emissions by sector, emission reductions

achieved relative to the 2018 baseline, and the contribution of mitigation measures (e.g., renewable energy deployment, improved cookstoves, reforestation). The government of Nigeria has focus on key areas with mitigation potential of over 20 Mt CO2e. In the energy sector, the goal to achieve a 60% reduction in fugitive emissions (leaks and venting) from the oil and gas industry is a major focus with a mitigation potential of 27.3 Mt CO2e. The transport sector also stands out, with a significant mitigation potential of 44.3 Mt CO2e from the widespread adoption of electric and CNG vehicles. Additionally, within the LULUCF sector, Nigeria aims to lower the deforestation rate by 60%, which offers a substantial mitigation potential of 304.8 Mt CO2e, while also pursuing a mitigation potential of 34.4 Mt CO2e by increasing forest area through reforestation and afforestation

Table 3: NDC 3.0 Mitigation Measures and Emission Reduction Potential

	NDC 3.0 Mitigation Measures	Mitigation Potential (Mt CO_2 e)
Energy Sector		
1	Increase the share of renewable energy in electricity generation	12.220
2	Implement Energy Efficiency measures in the electricity sector	11.247
3	Replace coal and other fossil fuels with cleaner alternatives under Manufacturing and Construction Industries[4]	8.462
4	Introduce green or blue hydrogen and nuclear after 2035 (included to be in line with GST report) and to be determined under the National Green Hydrogen Policy under development, and implementation of electricity generation from nuclear plants as per the NIRP 2024	Not estimated
5	Emission reductions in Transport category	44.312
6	Implement Energy Efficiency measures in the road transport category[5]	0.670
7	Modal shift for mass transit	16.234

[4] Nigeria Energy Transition Plan 2021 https://energytransition.gov.ng/
[5] Nigeria NDC (2021). https://unfccc.int/sites/default/files/NDC/2022-06/NDC_File%20Amended%20_11222.pdf

8	Reducing emissions in the Aviation industry as Nigeria is exploring the adoption of Lower Carbon Aviation Fuel and Sustainable Aviation Fuel to partially replace Jet kerosene[6]	Not estimated
9	Adoption of efficient lighting by households	1.111
10	Reduce emissions in the Commercial, Institutional, and Residential categories	9.105
11	Reduce production of charcoal	1.844
12	Adopt sustainable practices in the Oil and Gas Industry[7]	29.363
IPPU Sector		
13	Reduce emissions in the cement industry	0.690
14	Reduce emissions from products used for Refrigeration and Air-Conditioning	13.322
Agriculture Sector		
15	Upscale adoption of ranching for cattle inclusive of dairy production	1.582
16	Improved manure management system for production of biogas	No target set
17	Lower methane emissions from rice cultivation	0.547
18	Enhance mitigation through the adoption of circular economy practices within the Climate Smart Agriculture concept on 20% of cropland area	5.515 Mt CO2 e – Accounted under LULUCF for soil carbon
LULUCF Sector		
19	Increase sink capacity of national forests (25% of national area) while addressing deforestation through reduced wood removal	342.39
20	Enhance removals through the preservation and restoration of oceans and coastal ecosystems	partly covered under Measure 19
Waste Sector		
21	Upscale recycling activities while decreasing solid waste generation at source	9.205
22	Adoption of aerated wastewater treatment system, with low-emitting technology, by industries and in urban settlements	0.034

Preparation of the BTRs will follow Nigeria's MRV workflow: sectoral data collection → validation → central compilation by the NCCC → QA/QC → and submission to the UNFCCC.

Technical reviews will be undertaken by national experts prior to submission to ensure data consistency and methodological compliance.

3.4 Flexibility Provisions and Capacity Development

Recognizing the evolving capacity of developing countries, the ETF provides flexibility provisions in scope, frequency, and methodological depth of reporting. Nigeria will apply flexibility in sectors where data coverage is limited particularly in agriculture and waste while establishing a roadmap for capacity enhancement.

Ongoing technical assistance from partners such as the UNDP's Climate Promise Programme[8] and the World Bank's Partnership for Market Implementation (PMI)[9] is supporting Nigeria in developing the institutional capacity necessary for full ETF compliance. This includes training on the use of the Common Tabular Formats (CTFs), upgrading data management systems, and strengthening inter-agency collaboration.

The capacity-building process is also embedded within the Climate Change Act[10], which mandates the NCCC to promote data-driven climate governance and integrate transparency requirements into national development planning.

[8] https://climatepromise.undp.org/what-we-do/where-we-work/nigeria
[9] https://ppp.worldbank.org/library/partnership-market-implementation-facility
[10] https://climate-laws.org/documents/nigeria-s-climate-change-act_a2f0?id=nigeria-s-climate-change-act_5ef7

4. Legal Framework and Institutional Arrangements for NDC Tracking

A functional framework for tracking and reporting Nigeria's Nationally Determined Contribution depends fundamentally on the robustness of the legal and institutional arrangements supporting it. The foundation of any effective transparency and accountability system lies in the existence of clear legal mandates, established institutional responsibilities, and well-defined procedures for coordination, data management, and quality assurance. In the Nigerian context, these foundations have been progressively developed through the Climate Change Act (2021), the National Climate Change Policy (NCCP) 2021–2030, and the Nigeria Climate Change Response Programme (NCCRP).[11] These instruments articulate the governance architecture, policy coherence, and data systems needed to align national climate actions with the requirements of the Enhanced Transparency Framework under the Paris Agreement.

Nigeria's transition from voluntary reporting mechanisms under the UNFCCC's Measurement, Reporting, and Verification (MRV) regime to the ETF's more structured reporting obligations has necessitated the establishment of a legal frameworks that simplifies institutional mandates and data flows. The Climate Change Act (2021) represents the most significant step in this direction, institutionalizing climate governance across government and providing statutory backing for tracking and reporting mechanisms. Meanwhile, the NCCRP and the NCCP translate these legal provisions into operational programs that strengthen sectoral and institutional capacity, streamline inter-agency coordination, and promote standardized reporting across the sectors.

This chapter explores the legal and institutional frameworks that supports NDC tracking in Nigeria. It will examine the statutory and policy basis for reporting under the Climate Change Act, the national institutional arrangements for climate governance, and the mechanisms established for inter-agency collaboration, data sharing, and quality assurance.

4.1 Legal Foundations for NDC Implementation and Tracking

Nigeria's climate governance is anchored in a progressive set of legal and policy instruments that provide both strategic direction and binding obligations for implementing and tracking the country's NDC commitments. The Climate Change Act (2021) serves as the primary legislative instrument, while the National Climate Change Policy (2021–2030), and the Updated NDC 3.0 (2025) complement it by setting out specific policy priorities and institutional mechanisms.

[11] The Nigeria Climate Change Response Programme (NCCRP) is focused on the Energy Sector.

The Climate Change Act (2021) establishes the National Council on Climate Change (NCCC) and its Secretariat as the principal institutional framework for national climate governance. The Secretariat, headed by a Director-General, serves as the administrative, scientific, and technical arm of the Council, responsible for monitoring, verification, reporting, data collection, and coordination of national climate change actions (Sections 7–9, Climate Change Act, 2021). This structure effectively replaces DCC within the Federal Ministry of Environment, which previously coordinated Nigeria's climate change activities

Complementing this statutory framework, the National Climate Change Policy (NCCP) 2021–2030 sets out Nigeria's strategic approach to climate change governance. It highlights the importance of establishing a clear legal foundation for MRV systems, strengthening institutional capacity, and ensuring policy coherence across federal, state, and local government levels. The NCCP emphasizes a "whole-of-government" approach, encouraging integration of climate considerations into national planning, budgeting, and development strategies. It also calls for the establishment of a harmonized data management and information-sharing framework that supports transparency and accountability in NDC implementation.

The Nigeria Climate Change Response Programme translates the NCCP's provisions into programmatic activities. Supported by the European Union, the NCCRP was designed to strengthen Nigeria's institutional framework for climate governance and develop national systems for MRV and NDC tracking. It introduced pilot activities to test inter-agency coordination mechanisms, develop legal and procedural templates for data sharing (such as Memoranda of Understanding and Data-Sharing Agreements), and align Nigeria's emerging MRV systems with international ETF guidance (NCCRP, 2022).

Finally, the Updated NDC 3.0 (2025) establishes the substantive targets and indicators that the legal and institutional frameworks are meant to operationalize. It sets a new baseline year (2018), defines unconditional and conditional emission reduction targets (168.2 $MtCO_2e$ and 184.9 $MtCO_2e$ by 2035 respectively), and identifies mitigation measures across key sectors. The NDC 3.0 document explicitly calls for institutional strengthening, improved data quality, and the development of tracking systems to support transparency in implementation.

These instruments (policies and documents) form a coherent legal and policy foundation that enables Nigeria to operationalize its ETF reporting obligations.

4.2 Roles and Responsibilities of National Institutions

Nigeria's institutional structure for climate governance reflects a multi-level system involving apex decision-making bodies, technical coordination units, sectoral implementing agencies, and subnational institutions. This multi-tiered framework ensures that both national and sectoral perspectives are adequately represented in NDC implementation and reporting.

At the apex of this structure is the NCCC, chaired by the President of the Federal Republic of Nigeria. The NCCC provides high-level political guidance and policy oversight, ensuring that climate change considerations are mainstreamed into national development planning and economic decision-making. Its membership includes Ministers responsible for Environment, Finance, Energy, Agriculture, Transportation, and other key sectors, as well as representatives from the private sector and civil society. Through its policy directives, the NCCC ensures coherence between climate actions and broader sustainable development objectives (Climate Change Act, 2021). The NCCC manages the national GHG inventory, oversees MRV and NDC tracking systems, coordinates with line ministries and agencies to collect sectoral data, and ensures compliance with international reporting obligations. It also leads the development of Nigeria's Biennial Transparency Reports (BTRs) and National Communications (NCs), serving as the primary custodian of national climate data.

Below the NCCC, the DCC within the Federal Ministry of Environment acts as the Climate Change Desk for the Ministry (as per Section 23 of the Act).

The National Bureau of Statistics (NBS) plays a critical supporting role by providing economic and demographic data necessary for emissions modelling and indicator development. The NBS's collaboration with the NCCC ensures that emissions data are consistent with national accounts and macroeconomic indicators, such as GDP and population projections.

Sectoral Ministries, Departments, and Agencies (MDAs) provide activity data and policy information necessary for estimating emissions and tracking mitigation progress. For example, the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) supplies flaring and venting data for the energy sector, the Federal Ministry of Agriculture and Food Security (FMARD) provides livestock and fertilizer use statistics, while the National Space Research and Development Agency (NASRDA) and Forestry Research Institute of Nigeria (FRIN) supply land-use and forest cover data for the LULUCF sector. These agencies, through Memoranda of Understanding coordinated by the NCCC, contribute to the national MRV database and the Common Tabular Formats (CTFs) required under the ETF.

The NCCRP introduced an institutional model emphasizing technical working groups (TWGs) and inter-agency committees to ensure sustained coordination. These TWGs—organized by sector (energy, industry, agriculture, LULUCF, and waste) bring together data officers and experts from MDAs to harmonize methodologies, validate data, and resolve technical inconsistencies. The approach aligns closely with ICAT's recommended structure for transparent national reporting systems (ICAT, 2020).

At the subnational level, State Ministries of Environment are gradually being integrated into the NDC implementation framework. They are expected to track local mitigation actions, particularly in areas such as renewable energy deployment, forest restoration, and waste management. The Climate Change Act encourages states to establish their own climate councils and contribute data to the national MRV system, ensuring vertical integration between federal and subnational reporting.

In addition to the technical and sectoral institutions described above, **financial and economic institutions** play a critical role in enabling and tracking the implementation of Nigeria's NDC. The **Federal Ministry of Finance** provides overall coordination of climate-related public finance and ensures alignment between NDC priorities and national budgeting processes. The **Budget Office of the Federation** supports the integration of climate considerations into annual budget planning and expenditure tracking, while the **Debt Management Office (DMO)** facilitates access to sustainable and climate-aligned financing instruments, including green bonds and other sovereign financing mechanisms. Development finance institutions such as the **Nigeria Sovereign Investment Authority (NSIA)** and the **Development Bank of Nigeria (DBN)** support the mobilization and channeling of private and concessional finance toward climate-related investments, including renewable energy, sustainable infrastructure, and low-carbon industrial projects. These institutions also contribute to monitoring climate finance flows and investment outcomes, working in coordination with the NCCC and other relevant agencies to strengthen the tracking of financial resources supporting NDC implementation.

Table 4: Data Providers Across the NDC Sectors

S/N	Category	Sector	Data Providers
1	Energy	Power	NERC, NBET, TCN, Generating Companies, REA
2		O&G	NMPDRA, NUPRC, NNPC, IoCs, NoCs, Independent Oil Companies, NGC, Refineries, PPMC, The midstream and downstream operators (MOMAN, DAPPMAN, LPG/LNG/CNG marketers and private refineries

S/N	Category	Sector	Data Providers
3		Transport (RTS)	FMoT, NBS, the Motor Licensing Authorities of the State Ministries of Finance, the Nigerian Union of Road Transport Workers (NURTW), and the operators of mass transits, including luxury buses, fuel tankers and trailers.
4		Transport (OTS)	*Aviation* NBS, NiMET, Fuel Marketers (NNPC; Major & Independent Markets), All Operating Airlines, FAAN, NAMA, NCAA *Maritime* Shipping Companies (Indigenous and Foreign), Fuel Suppliers (i.e. NNPC, Major and independent Oil companies), NBS, NPA, NIMASA, NIWA, NAMA *Rail Transport* Fuel suppliers (e.g., NNPC, Independent and Major Oil Marketers), NBS, Nigerian Railway Corporation (NRC)
5	AFOLU	Agriculture (Crop Production)	State Ministries of Agriculture, Agricultural Development Projects/programs, Private Sectors (Large farms, and Cooperatives), Research Institutions, (IAR, ARCN etc.), Development Partners (FAO, UNDP etc.)
		Agriculture (Livestock)	State Ministries of Agriculture, Agricultural Development Projects/programs, Private Sectors (Large farms, and Cooperatives), Research Institutions, (IAR, ARCN etc.), Development Partners (FAO, UNDP etc.)
		Forestry	State Departments of Forestry, Office of the Surveyor-General, National Space Research and Development Agency (NASRDA), National Population Commission, The REDD++ Project Office, Forestry Research Institute, Other international data bases like FAOSTAT, Global Forest Database etc.
6	IPPU	Industries[12]	MAN, SMEDAN, Ministry of Solid Minerals Development, Ministry of Trade and Investment, Private Sector Operators.
7	Waste	Waste	All Waste Management Agencies across the States and the Federal Capital Territory e.g., LAWMA, NISEPA, KUDA etc., Private Sector.

[12] There are several industries in the country and will be very important to have e-registry for data in the sector to collect data at Industry level

S/N	Category	Sector	Data Providers
8	Water	Water	All Water Management Agencies across the States, the Federal Capital Territory, Non-governmental and Donor Agencies such (CBO, Water AID, EU, World Bank and UNICEF etc.)

4.3 Data-Sharing and Inter-Agency Collaboration Framework

The NDC 3.0 clearly states that Nigeria will operationalize a "national MRV and NDC-tracking system under the oversight of the National Council on Climate Change Secretariat", and will formalize data-sharing arrangements across Ministries, Departments and Agencies (MDAs), sub-national institutions, and private sector operators to support ETF compliance. Nigeria has developed three MRV systems for tracking emissions, mitigation and support, and an M&E for tracking adaptation for reporting in the BTRs. However, these are not fully operational as evidenced by their limited level of success when rolled out during the preparation of the BTR1. The NDC 3.0 noted that the key challenges included the absence of a clear coordination body for implementing the NDC, the divide between national and subnational institutions relative to their duties and responsibilities, and lack of capacity.

Although the Biennial Transparency Report 1 (BTR1) confirms that the government "has begun strengthening national systems and institutional arrangements to track progress made in implementing and achieving its NDC, including sectoral MRV and data management systems" and that the NCCC Secretariat coordinates technical institutions and line ministries in preparation for ETF-aligned reporting cycles, Nigeria still faces significant challenges related to limited capacity, data gaps across sectors, and the need for full operationalisation of the national MRV framework. However, BTR 1 also introduced an internal annual MRV cycle, to be led by the NCCC, during which sectoral agencies will provide updated activity data and progress indicators for inclusion in national reporting. This means that Nigeria has already embedded a recurring inter-agency reporting structure that aligns with the biennial reporting timeline under Article 13 of the Paris Agreement.

To support this national coordination function, Nigeria has begun developing formal data-sharing protocols, including Memoranda of Understanding (MoUs) and Data-Sharing Agreements (DSAs) between the NCCC Secretariat and major data custodians such as the NBS, the Nigerian Upstream Petroleum Regulatory Commission (NUPRC), the Federal Ministry of Agriculture and Food Security (FMARD), and the National Space Research and Development Agency (NASRDA). The NDC 3.0 explicitly references the need for "data and information-sharing frameworks across institutional levels, including federal-state coordination" to support transparency and accountability in mitigation tracking. As

implementation instruments, MoUs and DSAs will define the roles of each institution, specify reporting timelines, standardize data formats aligned with Common Tabular Formats (CTFs), and ensure traceability and confidentiality requirements particularly for facility-level industrial data.

A practical foundation for these arrangements already exists through Nigeria's participation in the Initiative for Climate Action Transparency (ICAT) programme. Through ICAT, Nigeria has developed sector-specific MRV frameworks, especially in the oil and gas sector, which include clear data flows from operators to regulators and from regulators to the national MRV system. The ICAT Oil & Gas MRV report outlines the introduction of calibrated measurement systems, facility-level reporting, QA logs, and data integration pipelines into a national database for GHG reporting. These structures serve as a model for scaling coordination across other sectors and demonstrate that Nigeria is not merely planning MRV arrangements but actively piloting them.

Following ICAT best practices, DSAs should contain provisions that specify:

- the nature of data to be provided (e.g., energy production, agricultural yields, waste volumes);
- the responsible unit and contact personnel.
- data validation and quality assurance protocols.
- frequency of data updates.
- and the mechanisms for resolving discrepancies or disputes.

4.4 Quality Assurance, Quality Control (QA/QC), and Archiving Systems

A credible national transparency system depends on the existence of clear procedures for ensuring that climate-related data are accurate, consistent, traceable, and securely stored. For Nigeria, the development and institutionalization of such systems is underway, and the country has already demonstrated foundational QA/QC and archiving practices through its recent transparency submissions and MRV enhancement initiatives.

Nigeria's First Biennial Transparency Report (BTR1) confirms that the country has implemented sectoral data collection, analysis, and archiving processes as part of the preparation of the national greenhouse gas (GHG) inventory. During the BTR1 cycle, sector-specific MDAs actively participated in data generation and submission, marking an important milestone in formalizing national QA/QC and documentation routines. The BTR1 specifically notes that government institutions undertook sectoral

data collection, analysis and archiving processes for the national GHG inventory, demonstrating that quality control and record-keeping activities are already operational at sectoral and national levels.

Institutional Structure for QA/QC

Nigeria currently operates a multi-layered QA/QC system that reflects both emerging legal mandates and practical experience gained during the BTR1 preparation and ongoing MRV initiatives.

At the sector level, relevant MDAs such as the Nigerian Upstream Petroleum Regulatory Commission (NUPRC), the NBS, the Federal Ministry of Agriculture and Food Security (FMARD), and the National Space Research and Development Agency (NASRDA) serve as primary data generators and custodians. These institutions are responsible for verifying activity data, checking the consistency of annual estimates with previous submissions, and documenting data sources and methods prior to transmission. This arrangement aligns with the approach used in the BTR1, where MDAs ensured that submitted datasets were accompanied by supporting documentation and validation steps.

At the central coordination level, the NCCC Secretariat plays a coordinating and reviewing role. The Secretariat synthesizes sectoral submissions, undertakes consistency checks across datasets, and manages national documentation files associated with mitigation tracking and GHG inventory compilation. The BTR1 preparation process demonstrated that the central climate institution engaged in cross-sectoral assessment of data inputs, supported by technical experts, to ensure methodological coherence and reporting consistency.

Furthermore, independent technical support remains an integral part of Nigeria's QA/QC landscape. During the BTR1 process, Nigeria benefited from external expert engagement and technical support through international programs such as the Initiative for Climate Action Transparency (ICAT) and United Nations Development Programme (UNDP)-supported MRV capacity-building activities. These partners contributed to methodological review, improvement of calculation sheets, and institutional strengthening. Such collaboration represents a practical element of quality assurance and reflects Nigeria's transition toward enhanced transparency arrangements.

Archiving and Information Management

Archiving is a key requirement of the enhanced transparency system under the Paris Agreement, and Nigeria has already begun operationalizing records-management structures. In the BTR1, the government confirmed that archiving activities accompanied national inventory processes, ensuring that submitted data, methodologies, and supporting evidence were retained and accessible for future

reporting cycles. This reflects a commitment to transparency, traceability, and retention of institutional memory.

Under the current arrangements, sectoral institutions retain primary source data, including raw activity data and background records. These institutions transmit validated datasets and supporting documents to the NCCC Secretariat, which acts as the central custodian for consolidated climate information. The Secretariat stores national-level reporting files, including calculation spreadsheets, methodological notes, and QA/QC records. This layered archiving structure aligns with international best practices by ensuring that sector-level expertise and records are preserved while establishing a national repository for official reporting materials.

In addition, ICAT-supported MRV pilots particularly in the oil and gas sector have introduced structured archiving tools, verification logs, and documentation templates, serving as a replicable model for other sectors. These templates ensure that data sources, calculation sheets, and evidence trails are preserved systematically, thereby strengthening Nigeria's long-term institutional capacity.

4.5 Institutional Arrangements for Tracking Internationally Transferred Mitigation Outcomes (ITMOs)

To operationalize Nigeria's participation in Article 6 of the Paris Agreement, the country has recently strengthened its institutional framework for managing carbon market activities. In October 2025, the President approved a National Carbon Market Framework (NCMF), which formalizes the role of key institutions and establishes the foundation for Nigeria's involvement in international mitigation cooperation.

Under the NCMF, the NCCC serves as the *Authorizing Entity* for ITMOs. To operationalize market functions, the policy establishes a Carbon Market Office within the NCCC Secretariat, responsible for managing day-to-day carbon-market operations, including project approval, ITMO authorization, and registry maintenance. There is also a Carbon Market Advisory Body, the Intergovernmental Committee on Carbon Market Activation (IGCCMA), which provides strategic oversight, coordinates across ministries, and supports rulemaking.

The Manual of Procedures (MoP), developed under the Carbon Market Activation Policy, details how Nigeria will implement Article 6.2 activities. It outlines the full mitigation-activity cycle from proposal and validation to verification, authorization, and issuance of ITMOs. The MoP also prescribes the use of *independent third-party verifiers* (validation / verification bodies) in line with international standards.

For tracking, Nigeria is establishing a national carbon registry, where ITMO projects, issuance, transfers, and retirements will be recorded. The registry is central to applying *corresponding adjustments*, a necessary accounting mechanism to prevent double counting as required under the Paris Agreement.

However, while the institutional architecture is now clearly laid out in policy, there remain risks and uncertainties: the NCMF and MoP are not yet backed by dedicated *statutory law*, which means the legal enforceability of some carbon-market functions (including ITMO authorization) could be less robust than in jurisdictions with dedicated carbon-market legislation. Moreover, capacity to verify, maintain the registry, and manage cross-border transactions will need further strengthening.

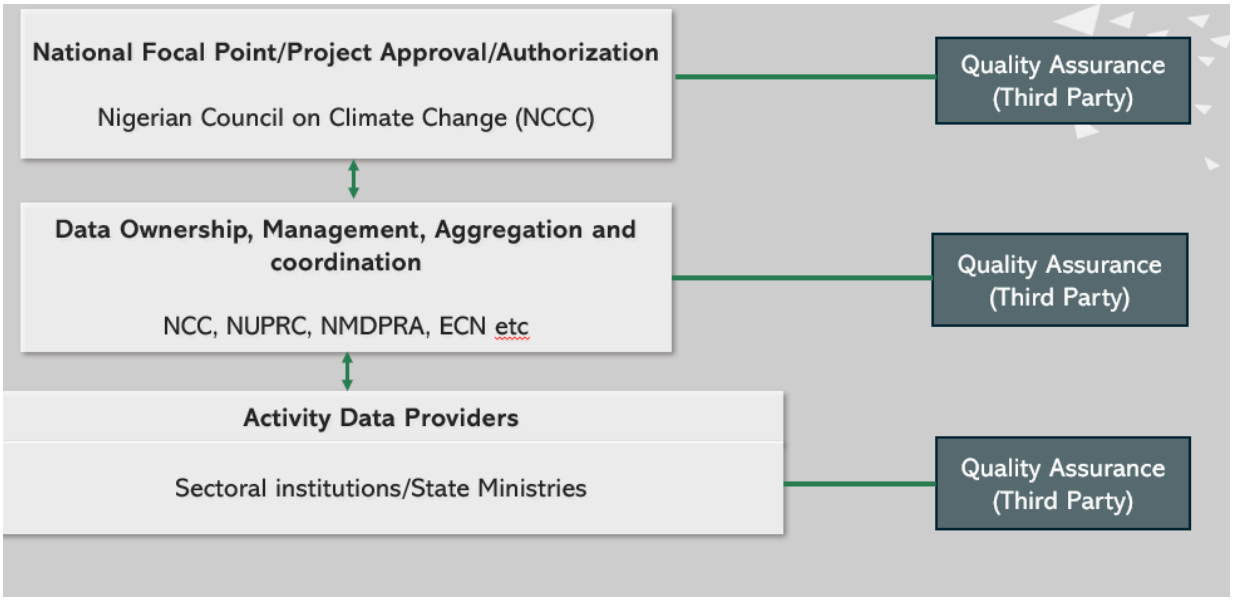
Table 5: Institutional Arrangements for Tracking Internationally Transferred Mitigation Outcomes (ITMOs) in Nigeria

Institution / Body	Role in ITMO / Carbon Market	Current Status / Notes
National Council on Climate Change (NCCC)	Authorizing Entity for ITMOs; approves projects, authorizes ITMOs, oversees registry and national carbon market operations	Operational under policy (NCMF); budget line restored; statutory authority pending full legal backing.
Carbon Market Office (within NCCC Secretariat)	Day-to-day management of carbon market functions; registry maintenance; monitoring of project implementation	Operational under policy; responsible for registry entries, issuance, and retirements of ITMOs.
Intergovernmental Committee on Carbon Market Activation (IGCCMA)	Strategic oversight; inter-ministerial coordination; advisory role on rules and procedures	Established under policy; advisory and oversight function; supports NCCC and Carbon Market Office.
Independent Third-Party Verifiers (Validation & Verification Bodies)	Conduct project validation, verify mitigation outcomes, ensure compliance with international standards	Accreditation required; limited capacity currently; essential for ITMO issuance.
National Carbon Registry	Records ITMO projects, issuance, transfers, retirements; corresponding adjustments to avoid double counting	Operational in draft; full legal and interoperability details under development.

Line Ministries / Sectoral MDAs (e.g., FMARD, NUPRC, NBS)	Provide activity data, emissions statistics, sectoral reporting to support ITMO validation and national MRV	Active in data provision; inter-agency coordination formalized via MoUs; integration with registry ongoing.
Climate Change Fund / Treasury	Receives proceeds from ITMOs and carbon market activities; allocates funds to mitigation projects and institutional support	Fund established; financial sustainability and capitalization still being strengthened.

The figure below shows a structured flow of data processes.

Figure 5: Institutional Architecture and Governance Structure



5. Methodological Framework for NDC Tracking

Nigeria's Nationally Determined Contribution (NDC 3.0) represents one of the most comprehensive climate commitments in Africa, combining ambitious mitigation targets, adaptation priorities, and socio-economic transformation objectives. Under NDC 3.0, Nigeria transitioned from an emission reduction % relative to the BAU scenario to an economy-wide absolute emissions reduction, Nigeria is now targeting net zero by 2060. Intermediate targets are absolute emissions reductions of 168.2 Mt CO2 e in 2030 and 184.9 Mt CO2 e in 2035 from base year 2018 towards net zero by 2060. These economy-wide absolute emissions reductions represent 29% and 32% of net national emissions of 2018, in 2030 and 2035, respectively. The NDC 3.0 retains a 20 percent unconditional reduction objective and defines its conditional ambition as 80 percent of the 29 percent and 32 percent reductions, contingent upon international financial, technological, and capacity-building support. Achieving these targets requires a robust monitoring system that ensures transparency, accuracy, and accountability across all sectors. The methodological framework articulated in this chapter provides the operational architecture for tracking, reporting, and evaluating Nigeria's progress under the Paris Agreement's Enhanced Transparency Framework.

This framework is anchored in the Climate Change Act of 2021, which established the National Council on Climate Change (NCCC) as the apex climate governance authority, mandated to coordinate climate action across all tiers of government and sectors of the economy. The Act institutionalizes carbon budgets, strengthens accountability mechanisms, and assigns leadership functions to sector Ministries, Departments, and Agencies (MDAs). The NCCC-Secretariat has the primary responsibility for coordinating national MRV systems, compiling Biennial Transparency Reports (BTRs), National Communications (NCs), and maintaining Nigeria's National GHG Inventory.

Nigeria's system incorporates global best practices and aligns fully with the modalities, procedures, and guidelines (MPGs) adopted at COP24 (Decision 18/CMA.1), which provide detailed instruction on transparency systems under Article 13 of the Paris Agreement. It also benefits from capacity-building and technical support through international instruments, including the Initiative for Climate Action Transparency (ICAT), the UNFCCC ETF capacity-building programme, and World Bank Article 6 readiness platforms. Lessons from Nigeria's First Biennial Transparency Report (BTR1) greatly inform the system's evolution, strengthening institutional mandates, data sharing processes, QA/QC and archiving systems, and cross-sectoral coordination mechanisms.

The framework goes beyond compliance. It functions as a strategic instrument for national development, improving evidence-based policy decisions, guiding resource allocation, strengthening

climate finance access, and preparing the foundations for participation in carbon markets under Article 6.

5.1 Forms of Tracking Progress

5.1.1 Tracking Progress toward Nigeria's National Emissions-Reduction Target

Tracking progress toward Nigeria's national mitigation target requires a rigorous system that quantifies economy-wide emissions trends and evaluates performance against the reference year (2018) emission levels outlined in the NDC 3.0. This monitoring begins with the National GHG Inventory System, which serves as the authoritative reference for measuring annual emissions across the five IPCC sectors: Energy, Industrial Processes and Product Use (IPPU), Agriculture, Forestry and Other Land Use (AFOLU), Waste, and LULUCF.

The inventory is compiled using IPCC 2006 Guidelines and supported by sector-specific protocols and data reporting templates. Activity data is generated by mandated institutions including the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) for oil and gas methane and flaring data, the Rural Electrification Agency (REA) for distributed renewable energy deployment, the Nigerian Electricity Regulatory Commission (NERC) for power sector operational data, the Federal Ministry of Agriculture and Food Security (FMAFS) for livestock and rice methane data, and sub-national forestry authorities for land-use reporting. These institutions supply data annually to the NCCC through formalized reporting channels.

The assessment does not merely involve comparing annual emissions figures. It evaluates whether Nigeria's emissions trajectory aligns with the linear reduction pathway implied by its carbon budget obligations under the Climate Change Act. It also incorporates structural economic indicators such as GDP growth rate, population growth, and technology penetration to ensure that emissions performance is contextualized within Nigeria's development trajectory.

Nigeria distinguishes between domestically achieved reductions and reductions requiring international support, ensuring that reporting accurately reflects the country's differentiated obligations under the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC). Progress reporting is communicated through national annual progress reports, BTR submissions, and regular stakeholder reviews convened by the NCCC in partnership with line MDAs and development partners.

To ensure robustness, Nigeria's national emissions-tracking approach incorporates uncertainty assessments, methodological consistency checks, and recalibration of historical data as necessary

consistent with ETF principles on transparency, accuracy, completeness, comparability, consistency (TACCC) (UNFCCC 2018, Decision 18/CMA.1). The inventory development process includes structured consultations with data-providing institutions, technical experts, academia, and private sector operators, particularly in hard-to-measure segments such as methane emissions from upstream petroleum operations and land-use emissions in forest frontier states.

Furthermore, Nigeria's progress assessment integrates a just transition dimension, recognizing that climate commitments must align with economic growth, energy access, and poverty reduction. The Energy Transition Plan (ETP, 2022) identifies natural gas as a transition fuel to support economic development while advancing renewable expansion and clean cooking adoption. Annual evaluation therefore considers not only emissions levels but also the balance between climate action and socio-economic imperatives, reinforcing the principle of "development-compatible decarbonization."

In alignment with the validated Just Transition Green Action Plan (JT-GAP), the MRV framework has been expanded to incorporate socio-economic indicators alongside traditional GHG accounting. This ensures that climate mitigation efforts are assessed not only in terms of emissions reductions but also in relation to their broader social and economic impacts. Key indicators include employment impacts, tracking both job creation and displacement across transitioning sectors; energy access, assessing affordability and equitable distribution of energy services to ensure fairness in the transition process; and inclusive metrics, which evaluate the participation of vulnerable and underrepresented groups in green economy opportunities. This integrated approach strengthens the "just transition" dimension of the MRV system by embedding equity considerations into climate governance and performance tracking.

Nigeria's national progress reporting toward its NDC emissions target is publicly disclosed through the Biennial Transparency Reports, National Communications, and domestic policy reporting frameworks. The Climate Change Act mandates the NCCC to present the carbon budget performance and progress against emissions-reduction milestones to the National Assembly, thereby institutionalizing public transparency and accountability (Climate Change Act, 2021, Section 6).

5.1.2 Tracking of Internationally Transferred Mitigation Outcomes (ITMOs)

Nigeria's NDC 3.0 and national climate governance architecture recognize the importance of Article 6 mechanisms in mobilizing climate finance and providing cost-effective mitigation opportunities. The Climate Change Act empowers the NCCC to regulate carbon markets and ensure environmental

integrity and avoidance of double counting (Section 20). Tracking of ITMOs therefore follows a structured approach aligned with Article 6.2 guidance, requiring the Government to maintain a national registry, ensure corresponding adjustments, and apply internationally agreed reporting formats.

Nigeria is implementing an Article 6 readiness programme, supported by development partners including the World Bank and UNFCCC capacity-building initiatives. Tracking ITMOs involves:

- recording authorized mitigation activities generating eligible units.
- monitoring mitigation outcomes using approved methodologies.
- assigning corresponding adjustments for units exported and imported.
- documenting cooperative agreements with international partners; and
- reporting through structured transparency tables in BTR submissions (UNFCCC, 2021 Article 6.2 guidance).

The NCCC oversees authorization of carbon projects and unit issuance and maintains reporting compliance. Sector MDAs ensure that mitigation actions counted toward ITMOs are not simultaneously credited toward national domestic mitigation preserving environmental integrity. The national carbon registry, under development, will interface with the UNFCCC's Article 6 reporting platform, enabling transparent accounting of transferred and retained mitigation outcomes.

5.1.3 Tracking Progress in Implementing Mitigation Policies, Measures, and Actions

Over the years, several policies, measures and actions have been indicated by the government to enhance the national objective of addressing the impact of climate change.

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 taken into consideration:

- 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.

Nigeria's NDC 3.0 identifies mitigation actions across key sectors including power, transport, industry, oil and gas, agriculture, forestry, and waste management. Tracking implementation of these policies requires a structured MRV system that evaluates both qualitative and quantitative progress. The approach recognizes that emission-reduction outcomes may manifest gradually, while implementation milestones provide early indicators of progress.

The Government tracks:

- adoption and enforcement of climate-relevant policies (e.g., National Methane Guidelines, Clean Cooking Policy, Renewable Energy Policies);
- deployment of low-carbon technologies (e.g., solar mini-grids, electric mobility pilots, gas-flare-to-power systems);
- financial commitments to mitigation measures; and
- institutional strengthening and capacity-building interventions.

Data collection responsibilities are assigned to sector agencies: NUPRC for flare reduction and methane monitoring, NERC and REA for renewable electrification, FMARD for agricultural emissions interventions, and NESREA for waste-sector regulations. Each agency reports annually to the NCCC using standardized templates, in line with ICAT guidance on policy impact assessment and UNFCCC MPGs (ICAT, 2020; UNFCCC, 2018).

Nigeria's BTR1 established baseline institutional practices for tracking mitigation implementation and identified opportunities to improve data granularity and verification, particularly in agriculture, forestry, and distributed energy systems (Nigeria BTR1, 2024).

5.1.4 Projection of Greenhouse Gas Emissions

GHG projections are an essential feature of Nigeria's NDC tracking system, enabling forward-looking assessment of progress and informing policy adjustments. Nigeria develops emissions projections using

econometric and energy-system modelling approaches that incorporate GDP growth, population dynamics, energy demand, land-use change, and technology penetration rates (Nigeria NDC 3.0, 2025).

The baseline BAU trajectory is periodically updated to reflect evolving national circumstances, including changes in oil production, electrification expansion, agricultural practices, and industrial output. Projections consider multiple scenarios, including unconditional domestic policies, conditional international support scenarios, and decarbonization pathways under the Energy Transition Plan.

Nigeria aligns national projections with IPCC methodological guidance and UNFCCC requirements for communicating long-term strategies. Projection methodologies incorporate:

- macroeconomic parameters.
- energy balance and technology penetration projections.
- agriculture and land-use emission trends.
- urbanization and waste generation patterns; and
- structural economic transformation insights.

These projections inform carbon budget decisions and sector-specific emission caps mandated under the Climate Change Act. They are validated through expert stakeholder consultations and technical reviews, ensuring transparency and scientific rigor.

5.1.5 National Tracking of NDC Progress

5.1.5.1 Outcome Indicators (Cross-cutting and Sectoral)

Outcome indicators provide the quantitative basis for assessing actual progress in reducing GHG emissions at both the national and sectoral levels. They capture the extent to which Nigeria's implemented policies, measures, and programs contribute to lowering emissions relative to the Business-as-Usual (BAU) trajectory. In line with Article 13 of the Paris Agreement and the modalities outlined in Decision 18/CMA.1, these indicators enable transparent communication of emission-reduction results, comparability across reporting periods, and accountability for achieving stated targets.

At the cross-cutting level, Nigeria's outcome indicators include total national GHG emissions, emissions intensity per GDP, and emissions per capita. These metrics allow for an evaluation of whether the economy is decoupling growth from emissions. According to Nigeria's *First Biennial Transparency Report (BTR1, 2024)*, the country's total GHG emissions in 2018 were approximately 347,000 ktCO2e,

with the energy sector contributing over 60 percent. Tracking changes in this aggregate figure against the projected BAU scenario provides an immediate view of whether Nigeria is on course to achieve its NDC *targets*.

At the sectoral level, the outcome indicators become more specialized and aligned with the unique mitigation opportunities in each sector:

- **Oil and Gas Sector:** Reduction in gas flaring volumes, decline in methane emissions from production and transportation systems, and the percentage of gas utilized for power or reinjection. Data are primarily sourced from the Nigerian Upstream Petroleum Regulatory Commission (NUPRC), which reports flare and methane volumes under its Gas Flare Tracker and Methane Management Framework.
- **Power Sector:** Share of renewable energy in the national energy mix, measured in megawatts (MW) and as a percentage of total installed capacity. The Nigerian Electricity Regulatory Commission (NERC) and Rural Electrification Agency (REA) maintain these data.
- **Agriculture:** Changes in methane emissions from rice cultivation and livestock enteric fermentation, reductions in nitrous oxide from fertilizer application, and improvements in sustainable land management practices.
- **Land Use, Land-Use Change and Forestry (LULUCF):** Net carbon stock changes from afforestation, reforestation, and forest conservation projects, monitored by the Forestry Department of the Federal Ministry of Environment.
- **Waste Sector:** Quantities of methane captured and treated at landfill sites, as well as emission reductions achieved through recycling, composting, and waste-to-energy programs managed by state environmental protection agencies.

From the national perspective, these indicators enable the synthesis of sectoral outcomes into a comprehensive picture of progress. The NCCC aggregates data from sectoral MDAs to update national inventories and recalibrate projections. This system ensures that emission reductions achieved at sub-sector levels translate into measurable national progress toward the NDC's overarching goals. Furthermore, the NCCC's carbon budgeting mechanism, as provided under Section 20 of the *Climate Change Act (2021)*, depends on these outcome indicators to monitor compliance and guide subsequent carbon allocation to sectors.

Outcome indicators thus serve both performance evaluation and policy adjustment function. They reveal not only the emissions trajectory but also the sectors contributing most significantly to national

gains or lagging behind. In this way, Nigeria's approach embodies the TACCC (transparency, accuracy, completeness, comparability, and consistency) principle required by the ETF.

5.1.5.2 Output/Activity indicators (key performance indicators):

While outcome indicators measure what has been achieved in terms of emissions reduction, output or activity indicators monitor the implementation of actions and interventions that are expected to deliver these results over time. They serve as the operational metrics for assessing the execution of Nigeria's mitigation policies and are critical for identifying early progress, diagnosing implementation bottlenecks, and mobilizing further support.

In the Nigerian context, these indicators are tailored to reflect the nature of mitigation interventions outlined in the *NDC 3.0* and sectoral strategies. Examples include:

- **Energy and Power:** Megawatts (MW) of renewable energy capacity added to the grid or through off-grid solar mini-grids under programs such as the Solar Power Naija initiative. The expansion of distributed renewable systems directly supports the country's Energy Transition Plan, which aims to achieve net-zero emissions by 2060.
- **Oil and Gas:** Volume of associated gas captured and utilized, total gas flared reduced, and number of flare sites remediated under the Nigeria Gas Flare Commercialization Programme (NGFCP).
- **Clean Cooking:** Number of efficient and clean cookstoves distributed nationwide, particularly in rural and peri-urban communities. The Clean Cooking Alliance of Nigeria (CCAN) and the Federal Ministry of Environment track these data as part of efforts to reduce household air pollution and deforestation.
- **Forestry and Land Use:** Hectares of land reforested, number of community-based forest management plans implemented, and tree-survival rates from afforestation programs.
- **Waste Management:** Number of waste-to-energy facilities established, tons of waste diverted from landfills, and methane captured through composting and landfill gas projects.
- **Finance and Capacity Building:** Volume of climate finance mobilized domestically and internationally, number of trained technical officers, and quantity of implemented climate-smart projects.

Each indicator corresponds to a measurable deliverable, which can be verified annually through activity reports, administrative records, or third-party monitoring systems. The *BTR1* highlighted that institutional coordination remains a major determinant of data quality and recommended enhanced use of digital MRV platforms to streamline data flows from state-level agencies to the federal system.

Achieved vs Planned Framework

An important dimension of Nigeria's output indicators is the comparison between "achieved" and "planned" results. This framework measures progress against pre-defined national and sectoral targets and provides the basis for performance evaluation within the Enhanced Transparency Framework (ETF).

- The **planned indicators** represent Nigeria's stated intentions, for example, targets such as achieving 52% of on-grid and off-grid generation capacity from renewable energy sources through installed capacities of 10,400 MW Hydro, 5,700 MW Solar, 17,000 MW Gas, 2,500 MW DSM, 60% reduction in fugitive emissions (leaks and venting) by 2035, 100% phasing out of kerosene used for lighting, enhancing mitigation through the adoption of circular economy practices within the Climate Smart Agriculture concept on 20% of cropland area (Federal Republic of Nigeria, *NDC 3.0*, 2025).
- The **achieved indicators** reflect actual implementation outcomes — for instance, *2.8 GW of renewable capacity installed* by 2027, *50 percent flare reduction* in fugitive emissions achieved, *actual percentage of kerosine lightings that have been phased out, and actual percentage of Climate* Smart Agriculture deployed in Cropland area.

Comparing "achieved" versus "planned" indicators allows the NCCC to assess whether implementation is on track, identify lagging sectors, and adjust policy and budgetary priorities accordingly. It also strengthens accountability and transparency by enabling progress reports that show performance ratios, such as the percentage of targets achieved within each reporting period.

This performance comparison is integral to Nigeria's national Monitoring, Reporting, and Verification (MRV) cycle and forms part of the *Common Tabular Format (CTF)* reporting to the UNFCCC. It enables continuous performance tracking, facilitates alignment with the country's carbon budgeting process under the *Climate Change Act (2021)*, and provides evidence for accessing results-based climate finance mechanisms such as the Green Climate Fund (GCF) and Article 6 cooperative approaches.

5.2 Conceptual Link Between NDC, National Inventory, and Mitigation Policies

Nigeria's MRV architecture establishes a direct and systematic link between national emissions accounting, policy implementation monitoring, and NDC outcomes. The national GHG inventory provides the quantitative basis for assessing performance, while policy and action tracking captures qualitative and intermediate progress. Data flows between agencies and the NCCC ensure information consistency, while the NCCC provides strategic oversight, ensuring that mitigation interventions remain aligned with national development priorities.

This integrated system supports continuous improvement, enabling Nigeria to recalibrate strategies based on evidence and enhance transparency in line with ETF obligations (UNFCCC, 2018). It also strengthens eligibility for climate finance and Article 6 markets, reinforcing Nigeria's position as a continental leader in climate transparency infrastructure.

5.3 Approaches for Tracking Progress Toward NDC Targets

Tracking Nigeria's NDC requires methodological flexibility that recognizes the multi-dimensional nature of emission reduction pathways. The Paris Agreement permits Parties to adopt diverse target structures, and Nigeria's NDC 3.0 applies a combination of economy-wide, sectoral, and conditional/unconditional mitigation frameworks. Therefore, Nigeria's monitoring system employs several approaches simultaneously to ensure comprehensive evaluation of progress:

5.3.1 Absolute Emissions-Based Tracking

Absolute emissions-based tracking compares measured emissions to the 2018 base year emissions. It evaluates whether total national greenhouse gas emissions are declining relative to the base year level . Nigeria employs this approach in line with IPCC guidance and UNFCCC decision 18/CMA.1, which requires Parties to quantify progress in absolute terms where possible.

This method forms the core of the national emissions-reduction target. Absolute tracking is applied to the national total and disaggregated by sector (energy, IPPU, AFOLU, waste, and LULUCF), reflecting both mitigation ambition and sectoral transition dynamics.

5.3.2 Intensity-Based Tracking

Nigeria incorporates emissions intensity indicators to contextualize mitigation progress relative to economic and demographic growth. For example, emissions per unit of GDP and per capita emissions are monitored to evaluate decarbonization efficiency.

This approach is essential for a developing economy where emissions may grow moderately as industrialization and electrification expand. The metric helps assess whether Nigeria is “decoupling” emissions from economic growth in a just and inclusive manner consistent with national development priorities.

5.3.3 Sector-Based Tracking

Sector-based tracking represents an important aspect of Nigeria’s national system for assessing progress toward achieving NDC targets. This process involves the continuous monitoring and evaluation of mitigation activities, outcomes, and sectoral emission trends across priority sectors including oil and gas, power, industry, agriculture, forestry, and waste. This approach recognizes that each sector possesses distinct emission sources, mitigation potentials, and policy implementation pathways.

The *Climate Change Act (2021)* mandates every key emitting sector to establish and implement a sectoral carbon budget, under the oversight of the NCCC. These carbon budgets serve as measurable emission caps or allowable limits within a given period, consistent with the national carbon budget approved by the NCCC. Each sector ministry such as the Federal Ministry of Power, Federal Ministry of Environment, Federal Ministry of Agriculture and Rural Development, and Federal Ministry of Industry, Trade, and Investment is responsible for preparing annual performance reports that compare actual sector emissions against allocated budgets and mitigation targets.

This process therefore provides a bottom-up evaluation mechanism that captures the diversity of Nigeria’s mitigation landscape while ensuring accountability at the institutional level. It also supports the NCCC’s capacity to synthesize data across sectors for national-level reporting under the *BTR* and the *ETF*.

In practical terms, sector tracking involves a mix of quantitative and qualitative indicators tailored to each domain’s operational realities:

- **Oil and Gas Sector:** Tracking focuses on the volume of gas flared, the quantity of gas captured or utilized, methane emission rates from production, and the number of flare sites decommissioned or commercialized under the *Nigeria Gas Flare Commercialization Programme (NGFCP)*. The Nigerian Upstream Petroleum Regulatory Commission (NUPRC) provides real-time flare data through its *Gas Flare Tracker* and supports verification through independent monitoring.

- **Power Sector:** Progress is measured through indicators such as the share of renewable energy in the national generation mix, improvements in energy efficiency, and reduction in transmission losses. The *Solar Power Naija* initiative and Rural Electrification Agency (REA) projects are core contributors.

- **Industrial Processes:** Tracking focuses on process-related emissions in cement, steel, and manufacturing, as well as the adoption of cleaner technologies and substitution of high-GWP refrigerants.

- **Agriculture:** Sector monitoring captures methane emissions from rice cultivation and livestock, nitrous oxide emissions from fertilizer application, and the adoption of sustainable agricultural practices such as alternate wetting and drying (AWD) in rice production.

- **Forestry (LULUCF):** Metrics include forest area conserved, hectares reforested, carbon stock enhancements, and avoided deforestation. Nigeria's *REDD+ Strategy* and community forest management programs are integral tracking components.

- **Waste Management:** Indicators cover quantities of waste recycled or composted, volume of methane captured, and number of operational waste-to-energy plants.

The use of sector-based tracking ensures that progress is granular, verifiable, and policy-relevant. It allows Nigeria to tailor mitigation assessments to its diverse economy, facilitates targeted interventions, and provides data for evaluating how well each sector contributes to the overall national emission-reduction trajectory. Furthermore, this approach helps identify areas requiring technical or financial support which is a critical function in the context of Nigeria's just transition, where mitigation efforts must also deliver development co-benefits such as energy access, employment, and poverty reduction.

5.3.4 Economy-Wide Tracking

While sectoral tracking provides detailed insight into the performance per sector, economy-wide tracking offers a comprehensive assessment of whether Nigeria's climate policies and actions are collectively shifting the economy onto a low-carbon, climate-resilient pathway.

Economy-wide tracking involves aggregating sectoral data to evaluate progress toward the overall GHG emission-reduction target and assessing the structural transformation of the national economy. It examines how shifts in production, energy use, and investment patterns contribute to decoupling economic growth from emissions, a fundamental principle of sustainable development under the Paris Agreement.

Nigeria's approach to economy-wide tracking is highlighted in the *Climate Change Act (2021)*, *Energy Transition Plan (ETP, 2022)*, and the *NDC 3.0. These documents* collectively outline a national pathway to achieve net-zero emissions by 2060. The tracking framework integrates cross-sector indicators including:

- **GHG Emission Intensity of GDP:** This metric assesses how much GHG is emitted per unit of economic output, highlighting whether Nigeria's growth is becoming cleaner and more efficient.
- **Energy System Transformation Metrics:** Including the share of renewable and low-carbon energy in total supply, progress in electrification, and reductions in fossil-fuel dependency.
- **Land-Use Change Patterns:** Tracking deforestation, afforestation, and agricultural expansion to understand land-based contributions to national emissions and removals.
- **Clean Technology Penetration:** Measuring the adoption of energy-efficient technologies, electric mobility, and methane abatement technologies across sectors.
- **Climate Finance and Green Investment Flows:** Monitoring domestic and international funding mobilized for mitigation, adaptation, and just transition projects.

Nigeria assesses the collective impact of its mitigation portfolio and the alignment of its economic structure with long-term decarbonization goals. This approach reflects the Paris Agreement's expectation that developing countries progressively expand from sectoral targets toward economy-wide emission-reduction commitments (UNFCCC, 2018).

Economy-wide tracking also underpins Nigeria's *BTRs* and *Global Stocktake (GST)* participation, allowing the government to communicate its contribution to the global mitigation effort and

demonstrate accountability. Importantly, it provides a policy feedback mechanism: identifying emerging emission hotspots, assessing the cost-effectiveness of mitigation investments, and guiding the reallocation of resources to high-impact sectors.

5.4 Use of Common Tabular Formats (CTF) in NDC Tracking

Nigeria's transition to a robust transparency system has been strengthened by the adoption of Common Tabular Formats (CTF), as highlighted in the *ETF* of the Paris Agreement (Decision 5/CMA.3). CTF provides standardized tables for reporting on national GHG inventories, mitigation policies and actions, projections, financial and technical support received, and progress toward NDC targets.

CTFs serve multiple purposes:

1. **Standardization and Comparability:** Ensuring that Nigeria's data can be compared consistently over time and across countries.
2. **Transparency and Accountability:** Presenting a structured and verifiable representation of progress.
3. **Integration and Data Management:** Allowing national data from multiple sectors and agencies to be harmonized into a single reporting framework.

Nigeria's *BTR1* utilized UNFCCC CTF templates to present information on national GHG emissions and mitigation actions. The reported tables covered:

- National inventory summaries for 2010–2018.
- Progress in implementing mitigation policies and measures.
- Information on financial, technology transfer, and capacity-building support needs; and
- Projections of future emissions under various scenarios.

For domestic implementation, the NCCC has customized CTF templates for use by sectoral ministries and agencies. Each MDA submits its sectoral data in a standardized format annually. These data are reviewed for consistency and completeness before being aggregated into national-level CTF tables for submission to the UNFCCC Secretariat.

As Nigeria prepares for its *Second Biennial Transparency Report (BTR2)*, efforts are underway to align domestic templates further with the ETF's digital data management systems. These updates will

include reporting modules for Article 6 cooperative approaches (Internationally Transferred Mitigation Outcomes, ITMOs), once bilateral agreements are established.

The structured use of CTFs has also improved coordination among institutions and enhanced quality control, supporting Nigeria's broader goal of institutionalizing data transparency within its climate governance framework.

5.5 Treatment of Conditional and Unconditional Contributions

Nigeria's *NDCs* clearly differentiates between unconditional and conditional mitigation commitments, a distinction that underpins the tracking of implementation progress and support needs under the ETF.

5.5.1 Unconditional Contributions

Unconditional contributions represent mitigation actions that Nigeria commits to undertake using its domestic resources, including government funding, private-sector investments, and nationally mobilized finance. The unconditional target corresponds to 20 percent economy-wide absolute emissions reduction as recommended by the GST, with net zero target by 2060.

Tracking unconditional actions focuses on the implementation of policies and programs already funded and operationalized domestically. Examples include:

- Energy efficiency and demand-side management programs led by the Federal Ministry of Power and the Energy Commission of Nigeria.
- Deployment of solar mini-grids and distributed renewable energy solutions under the *Solar Power Naija* initiative.
- Gas flare reduction and utilization programs implemented through the *Nigeria Gas Flare Commercialization Programme (NGFCP)*.
- Forest protection and reforestation efforts under the *National Afforestation Programme*.
- Distribution of clean cookstoves through national and private-sector initiatives.

For each action, performance is measured using sectoral indicators within the MRV system, allowing Nigeria to track progress in real time against national commitments and resource allocations.

5.5.2 Conditional Contributions

Conditional contributions depend on the availability of international support in the form of finance, technology transfer, and capacity building. The conditional target has stated in the NDC 3.0 is 80% emission reduction of the 29% and 32% reduction of the estimated 2018 emissions in 2030 and 2035, respectively.

Tracking conditional actions involves assessing:

- The volume of international climate finance mobilized through multilateral and bilateral channels.
- Technology transfer and joint implementation arrangements with development partners.
- Capacity-building programs supported by international agencies; and
- Implementation of large-scale, externally funded mitigation projects such as industrial decarbonization programs, grid-scale renewable energy projects, and electric mobility initiatives.

For example, the *Nigeria Electrification Project (NEP)* financed by the World Bank and the *Scaling Solar Program* supported by the International Finance Corporation (IFC) contribute directly to conditional mitigation outcomes. Similarly, UNDP's *National Adaptation Plan Support Project* enhances institutional capacity that underpins both mitigation and adaptation actions.

Under the ETF, Nigeria must report not only the emissions impact of these conditional actions but also the nature, scale, and effectiveness of the international support received (UNFCCC, Decision 18/CMA.1). The NCCC, in collaboration with the Ministry of Finance and the Office of the Accountant General, maintains a database of climate finance inflows and project-level results to ensure transparency and avoid double counting.

In cases where mitigation actions are supported through **blended financing arrangements**, involving both domestic and international resources, the attribution of results will follow a proportional approach based on the relative contribution of each financing source. Where a project receives funding from domestic public resources, private sector investments, and international climate finance, the resulting emission reductions may be reported across unconditional and conditional contributions in proportion to the financing structure. Domestic resources will be associated with unconditional contributions, while the share supported through international finance, technology transfer, or capacity-building assistance will be reflected under conditional contributions. This approach helps

ensure transparency in reporting, avoids double counting of mitigation outcomes, and provides a clearer picture of how domestic and international support collectively contribute to Nigeria's NDC implementation.

6. Methodological Guidelines for the Assessment of the GHG Impact of Nigeria's Mitigation Actions, Policies, and Measures

The growing ambition of Nigeria's climate policy architecture, as reflected in NDC 3.0 and the national commitment to achieve net-zero emissions by 2060, requires a robust, transparent and nationally harmonized methodological system for assessing GHG impacts of mitigation actions, policies, and measures across all the relevant sectors. Nigeria's transition from a BAU-relative target to economy-wide absolute emissions reductions fundamentally increases the importance of reliable measurement practices, as emission reductions must now be traced directly to sectoral interventions and quantified against a clearly defined 2018 base year. This shift also aligns Nigeria with best practices under the GST and the ETF of the Paris Agreement, where Parties are expected to demonstrate, with evidence, the extent to which national actions contribute to global mitigation goals.

This chapter will explore the methodological foundation needed to support Nigeria's national MRV system, sector-level reporting arrangements, and the quantification of mitigation impacts for transparency reporting under BTR. The guidelines are drawn from the 2006 IPCC Guidelines for National GHG Inventories, refinements from the 2019 IPCC Update, relevant UNFCCC decisions including 18/CMA.1, methodological insights from Nigeria's First Biennial Transparency Report (BTR1, 2024), and the provisions of the Climate Change Act (2021) which established sectoral carbon budgets and require the tracking of policy performance.

The methodological framework presented in this chapter ensures that mitigation assessments across Nigeria's sectors are comparable, consistent with national modelling assumptions, verifiable, and aligned with inventory practices. It offers a nationally standardized approach to developing baselines, estimating policy impacts, calculating ex-post emission reductions, addressing data gaps, applying sector-specific computational methods, and integrating results into the national MRV architecture. By providing detailed methodologies for the Energy, IPPU, Agriculture, LULUCF, and Waste sectors, this chapter supports the full institutionalization of Nigeria's transparency system and ensures the ability of the NCCC to coordinate the accurate assessment of progress toward NDC targets.

6.1 Key Concepts Related to Mitigation Actions

Developing an accurate and transparent methodology for assessing mitigation impacts requires clarity about the concepts, definitions, and analytical categories that underpin the calculation of emission reductions.

Mitigation actions refer to any intervention designed to reduce GHG emissions or enhance removals compared with the level that would have occurred in the absence of the intervention. In Nigeria's context, mitigation actions include a broad range of activities such as the deployment of solar mini-grids under the REA, the reduction of gas flaring under the Nigerian Gas Flare Commercialization Programme (NGFCP), cement kiln energy-efficiency upgrades in the industrial sector, improved rice cultivation and livestock management under the agriculture sector, reforestation programmes through the National Forestry Trust Fund, and methane capture initiatives in the solid waste sector. These actions may take the form of policies, measures, regulations, infrastructure developments, technical upgrades, behavioral shifts, and financial mechanisms.

Nigeria's NDC 3.0 frames mitigation actions within an economy-wide context, requiring that all sectoral measures collectively contribute to the absolute reduction targets of 168.2 $MtCO_2e$ by 2030 and 184.9 $MtCO_2e$ by 2035. Therefore, every mitigation action assessed under these guidelines must be linked to the national mitigation pathway and contribute to the long-term trajectory toward net-zero emissions by 2060.

Mitigation assessment is also closely tied to the GST under the Paris Agreement, which requires Nigeria to demonstrate progress in implementing and achieving its NDC. This means the quantification methodologies must be sufficiently rigorous to contribute to global comparisons and assessments. The GST emphasizes improvements in accuracy, transparency, and comparability principles that have guided the development of these methodological guidelines.

The BTR plays a critical role in shaping Nigeria's methodological approach. In BTR1, Nigeria reported its GHG inventory and mitigation actions but also identified significant methodological inconsistencies and data limitations across sectors. These included challenges in collecting accurate activity data, reliance on default IPCC emission factors due to limited Nigeria-specific data, and insufficient institutional coordination.

A particularly important concept is the distinction between baseline emissions and policy scenario emissions. Baseline emissions represent the level of GHG emissions that would occur in the absence of a mitigation intervention, while policy scenario emissions represent the emissions that occur after the

intervention has been implemented. The difference between the two subjects to additionality, quality control, and uncertainty analysis constitutes the estimated emissions reduction. This methodological structure ensures that the contribution of Nigeria's mitigation actions can be measured transparently and used for national reporting, international reporting under the ETF, and where relevant international market mechanisms such as Article 6.

Another critical concept is additionality, which requires demonstrating that the emissions reduction would not have occurred without the intervention. For Nigeria, additionality is particularly relevant for mitigation actions that may be used for international cooperation under Article 6 mechanisms. In such cases, Nigeria must demonstrate that emission reductions are beyond business-as-usual expectations and exceed existing policy requirements.

Finally, the methodological guidelines emphasize consistency between the national GHG inventory and mitigation assessment methodologies. Nigeria's inventory uses IPCC methodologies, which means mitigation assessments must also use IPCC-consistent emission factors, equations, and activity data where possible. This ensures that reported mitigation impacts can be accurately aggregated with national emissions and can be used to determine progress toward NDC and carbon-budget targets.

6.2 Good Practice Methodology to Determine Baseline Emissions

Establishing a credible baseline is the foundation of any reliable assessment of mitigation impacts because the baseline represents the emissions trajectory that would reasonably occur in the absence of a mitigation action. In Nigeria, the importance of a well-defined baseline is amplified by the transition from an emission reduction relative to a BAU scenario to an economy-wide absolute emissions-reduction target, where the difference between actual emissions and the baseline directly determines the quantified impact of policy interventions. A poorly determined baseline can compromise the credibility of emission-reduction claims, reduce comparability across sectors, and undermine transparency under the ETF.

The development of a baseline requires careful consideration of Nigeria's socioeconomic dynamics, national development trends, sectoral policies, technological deployment, and historical emissions patterns. Baselines are not mere projections of past emissions, but structured estimates founded on transparent assumptions and robust data. Nigeria's BTR1 applied modelling approaches, such as the Long-range Energy Alternatives Planning (LEAP) system, to integrate population growth, GDP evolution,

sectoral activity data, and energy-use trajectories. This approach ensures consistency between national and sectoral baselines, enabling meaningful assessment of mitigation efforts.

Baseline methodologies typically employ two complementary approaches: historical trend extrapolation and scenario-based projection. Historical trends analyze past emission patterns and extend them into the future, suitable for sectors with stable growth and reliable activity data. Scenario-based projections incorporate assumptions about economic growth, energy consumption, technology adoption, and policy environments, offering a more dynamic and context-sensitive representation. In Nigeria, scenario-based projections are particularly relevant for energy and industrial sectors, where rapid infrastructure development and energy transition pathways significantly influence emission trajectories.

Sectoral disaggregation is critical to baseline credibility. Within the energy sector, emissions from power generation, oil and gas operations, and transport are modelled separately, reflecting differences in fuel type, conversion efficiency, and activity intensity. For the IPPU sector, sub-sectors such as cement, steel, and chemical production are treated individually to capture process-specific drivers. Agriculture baselines consider crop cultivation practices, fertilizer use, and livestock management, while LULUCF baselines track deforestation, afforestation, and forest degradation dynamics. Waste sector baselines focus on landfill emissions, wastewater treatment, and waste incineration. Disaggregation allows for more precise attribution of emission reductions to specific mitigation actions.

Data quality underpins baseline robustness. Key activity data includes fuel consumption, production volumes, land-use statistics, and waste generation rates. Emission factors, either default IPCC values or Nigeria-specific measurements, translate activity data into emission estimates. Responsible institutions supplying these data include the NCCC, NBS, Nigerian Electricity Regulatory Commission (NERC), Nigerian Upstream Petroleum Regulatory Commission (NUPRC), Nigerian Midstream Downstream Petroleum Regulatory Authority (NMDPRA), Federal Ministry of Agriculture and Rural Development (FMARD), Federal Ministry of Environment (FME), and other sectoral agencies. Where data gaps exist, interpolation, expert judgment, or regional proxies may be used, provided assumptions are documented transparently.

Calculations follow IPCC 2006 Guidelines, applying emission factors to activity data for each source. Baselines must also account for external factors unrelated to the mitigation action, such as population growth, energy demand trends, and policies already enacted but not yet fully implemented. For instance, anticipated effects from legislated renewable energy policies should be incorporated into the

baseline to avoid overstating the impact of new actions. This ensures that emission reductions are attributable only to additional efforts.

Finally, uncertainty analysis is a critical component of good practice methodology. Variability in activity data, emission factors, and assumptions introduces uncertainty in baseline estimates. Expert reviews are applied to quantify confidence ranges and identify key sources of uncertainty. Transparent documentation of these uncertainties allows stakeholders to interpret mitigation performance with a clear understanding of the potential variability, enhancing credibility and informing iterative improvements to the baseline.

6.3 Good Practice Methodology to Determine Policy Scenario Impacts

Assessing the impact of mitigation policies and measures requires a systematic methodology that compares actual or projected emissions under a policy scenario against the baseline. Policy scenarios are forward-looking projections reflecting the anticipated implementation of mitigation actions, including legislative measures, technological adoption, incentives, and behavioral interventions. The difference between the policy scenario emissions and baseline emissions represents the quantified reduction attributable to the intervention, providing a clear measure of effectiveness.

Policy scenario development begins with defining the scope, timeframe, and specific policy interventions to be analyzed. For the energy sector, this may include the introduction of renewable energy targets, energy efficiency standards, or gas flaring reduction programs. In agriculture, it could involve improved fertilizer application practices, methane reduction in livestock, or afforestation programs. For each sector, assumptions about implementation rate, technology adoption, and compliance levels must be explicit and supported by historical trends, expert judgment, or pilot project data.

Scenario modelling typically uses simulation tools such as LEAP or sector-specific process models. These tools allow for adjustments to activity data, technology penetration, and policy uptake to project future emissions under the scenario.

Uncertainty analysis is also critical in scenario assessment. Variability in policy implementation, external economic factors, and technology performance can significantly affect projected outcomes. Scenario comparisons and expert review are applied to quantify the range of possible impacts.

6.4 GHG Methods for Energy Sector Mitigation Policies and Measures

Table 6: Energy Sector NDC 3.0 Mitigation Measures

	NDC 3.0 PAMs	Conditionality	Status	Year of adoption	Start year of implementation
1	Increase the share of renewable [13]energy in electricity generation	Unconditional	Implemented	2016	2016
2	Implement Energy Efficiency measures in the electricity sector	Unconditional	On-going	2016	2016
3	Replace coal and other fossil fuels with cleaner alternatives under Manufacturing and Construction Industries[14]	Unconditional	On-going	2021	2021
4	Introduce green or blue hydrogen and nuclear after 2035 (included to be in line with GST report) and to be determined under the National Green Hydrogen Policy under development, and implementation of electricity generation from nuclear plants as per the NIRP 2024[15]	Conditional	Planned	2025	Not yet
5	Emission reductions in Transport category	Unconditional	On going	2021	2021

[13] Nigeria INDC (2016) https://cleantechnologyhub.com/wp-content/uploads/2022/07/NIGERIA_S-NATIONALLY-DETERMINED-CONTRIBUTION.pdf
[14] Nigeria Energy Transition Plan 2021 https://energytransition.gov.ng/
[15] NDC 3.0 (2025) https://unfccc.int/sites/default/files/2025-09/Nigeria%20NDC%203.0%20-%20Transimission%20Version%202.pdf

6	Implement Energy Efficiency measures in the road transport category[16]	Unconditional	Ongoing	2021	2021
7	Modal shift for mass transit	Unconditional	On going	2020	2020
8	Reducing emissions in the Aviation industry as Nigeria is exploring the adoption of Lower Carbon Aviation Fuel and Sustainable Aviation Fuel to partially replace Jet kerosene[17]	Conditional	Yet to be implemented	2025	Not yet
9	Adoption of efficient lighting by households	unconditional	On-going	2017	2017
10	Reduce emissions in the Commercial, Institutional, and Residential categories	unconditional	On-going	2021	2021
11	Reduce production of charcoal	unconditional	On-going	2019	2019
12	Adopt sustainable practices in the Oil and Gas Industry[18]	unconditional	On-going	2021	2021

6.4.1 Data Requirements

Key activity data includes fuel consumption in power generation, petroleum and gas extraction volumes, vehicle fuel use, and energy demand projections. Emission factors for fossil fuels, biomass, and electricity generation are required, as well as parameters such as plant efficiency, energy conversion rates, and fugitive emissions. Other parameters include projected adoption of renewable energy technologies and efficiency improvements.

Activity Data Required:

- Fuel consumption by type (coal, natural gas, petroleum products) in TJ or m^3
- Electricity generation by plant and fuel type (GWh)
- Fuel used in transport (litres of petrol/diesel)
- Gas flared (m^3)

[16] Nigeria NDC (2021). https://unfccc.int/sites/default/files/NDC/2022-06/NDC_File%20Amended%20_11222.pdf
[17] NDC 3.0 (2025)
[18] PIA (2021). https://pia.gov.ng/wp-content/uploads/2022/08/PIA-2021_compressed-1.pdf

Emission Factors & Parameters:

- IPCC default or Nigeria-specific emission factors (tCO_2/TJ fuel or kg CH_4/m^3 gas)
- Net calorific value of fuels (TJ/unit fuel)
- Plant/vehicle efficiency (%)
- Methane correction factors for flaring (MCF)

6.4.2 Data Sources & Responsible Institutions

Primary sources include the NBS, NERC, NUPRC, NMDPRA, Ministry of Power, and sectoral utilities. All collated data must be verified for completeness, consistency, and reliability.

6.4.3 Calculation Methods

Methods from GACMO

1. Increase the share of renewable energy in electricity generation

1 MW Hydro power connected to main grid in 2025			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	1 138 100		1 138 100
Project life	25		
Lev. investment	45 524		45 524
Annual O&M	5 691		5 691
Annual fuelcost		0	0
Total annual cost	51 215	0	**51 215**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission		0	0
Other			
Total CO2-eq. emission	0	0	**0**
US$/ton CO2-eq.			**0,0**

General inputs:		
Discount rate	0%	
Reference electricity price	0,00	US$/kWh
CO2-eq. emission coefficient	0,00	tCO2/MWh
Reduction option: Hydro Power		
O&M	0,5%	
Activity	1	MW
Investment in Activity	1138,1	US$/kW
Capacity factor	3961	Full time hours
Electricity production	3961	MWh/ year
Cost of electricity produced	0,01	US$/kWh
Reference option: No hydro power plant		

Notes:
The investment is from www.cdmpipeline.org: Dak Mi 4 Hydropower Project, Vietnam (ref=4970).
The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity is 16.95 W/m2.
The cost include: Construction, Equipment, Transmission line to grid, Construction work preparation, Other cost (consulting, tax, insurance, etc), Compensation and resettlement cost, Backup cost.

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1 MW Mini hydro power connected to main grid 2020			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	4 500 000		4 500 000
Project life	20		
Lev. investment	225 000		225 000
Annual O&M	22 500		22 500
Annual fuelcost		0	0
Total annual cost	247 500	0	**247 500**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission		0	0
Other			
Total CO2-eq. emission	0	0	**0**
US$/ton CO2-eq.			**0,0**

General inputs:		
Discount rate	0%	
Reference electricity price	0,00	US$/kWh
CO2-eq. emission coefficient	0,00	tCO2/MWh
Reduction option: Hydro Power		
O&M	0,5%	Of investment
Activity	1	MW
Investment in Activity	4500	US$/kW
Capacity factor	4000	Full time hours
Electricity production	4000	MWh/ year
Reference option: No hydro power plant		

Notes:
Source: "Current and Prospective Costs of Electricity Generation until 2050", DIW Berlin 2013.
The capacity factor is an average from the www.CDMpipeline.org

1 MW Mini hydro power off-grid			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	4,000,000		4,000,000
Project life	20		
Lev. investment	200,000		200,000
Annual O&M	20,000		20,000
Annual fuelcost		452,413	-452,413
Total annual cost	220,000	452,413	**-232,413**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	0	3,232	3,232
Other			
Total CO2-eq. emission	0	3,232	**3,232**
US$/ton CO2-eq.			**-71.9**

General inputs:		
Discount rate	0%	
Reduction option: Hydro Power		
O&M	0.5%	Of investment
Activity	1	MW
Investment in Activity	4000	US$/kW
Capacity factor	4000	Full time hours
Electricity production	4000	MWh/ year
Reference option: Existing diesel generator		
CO2-eq. emission coefficient	74.1	kgCO2-eq./GJ
Efficiency of diesel	33%	
Diesel consumption	43636	GJ
Diesel price	10.4	US$/GJ

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Solar PVs, large grid, 1 MW - 2025

Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	1,000,000		1,000,000
Project life	20		
Lev. investment	50,000		50,000
Annual O&M	10,000		10,000
Annual fuelcost		-	-
Total annual cost	60,000	-	**60,000**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission		-	-
Other			
Total CO2-eq. emission	-	-	-
US$/ton CO2-eq.			**0.0**

General inputs:		
Discount rate	0%	
Reference electricity price	0.00	US$/kWh
CO2-eq. emission coefficient	0.00	tCO2/MWh
Activity: Solar PV		
Size of solar PV	1.0	MW
Investment in Activity	1000	US$/kW
Daily insolation	5	hours
Annual capacity factor	1825	Full time hours
Efficiency factor	1	
O&M	1.0%	Of investment
Electricity production	1825	MWh
Cost of electricity produced	0.033	US$/kWh
Reference option: No solar PVs		
Electricity production	1825	MWh

Solar PVs, large grid, 1 MW - 24h storage - 2025

Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	2,100,000		2,100,000
Project life	20		
Lev. investment	105,000		105,000
Annual O&M	21,000		21,000
Annual fuelcost		-	-
Total annual cost	126,000	-	**126,000**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission		-	-
Other			
Total CO2-eq. emission	-	-	-
US$/ton CO2-eq.			**0.0**

General inputs:		
Discount rate	0%	
Reference electricity price	0.00	US$/kWh
CO2-eq. emission coefficient	0.00	tCO2/MWh
Activity: Solar PV		
Size of solar PV	1	MW
Investment in Activity	1500	US$/kW
Daily insolation	5.0	hours
Annual capacity factor	1825	Full time hours
Efficiency factor	1	
O&M	1.0%	Of investment
Electricity production	1825	MWh/year
Electricity production per day	5000	kWh/day
Unit cost of batteries	120	US$/kWh
Total cost of batteries	600000	US$
Cost of electricity produced	0.069	US$/kWh
Reference option: No solar PVs		
Electricity production	1825	MWh

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Solar/diesel mini-grid, 100 kW load

Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	60,000		60,000
Project life	20		
Lev. investment	3,000		3,000
Annual O&M	600		600
Annual fuelcost		701	- 701
Total annual cost	3,600	701	2,899
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission		58	58
Other			
Total CO2-eq. emission	-	58	58
US$/ton CO2-eq.			**49.6**

General inputs:		
Discount rate	0%	
Efficiency of diesel	30%	
Cost of diesel	10.4	US$/GJ
CO2-eq. emission coefficient	0.80	tCO2/MWh
Activity: Solar/diesel mini-grid PV		
Capacity of plant	100	kW
Size of the diesel	150	kW
Minimum load on diesel	40%	kW
Size of solar PV	40	kW
Investment in Activity	1500	US$/kW
Daily insolation	5	hours
Annual capacity factor	1825	Full time hours
O&M	1.0%	Of investment
Solar production	73	MWh
Cost of solar electricity produced	49.315	US$/kWh
Reference option: No solar PVs - pure diesel		
Electricity production	73	MWh
Diesel used	68	GJ

Solar PVs, small isolated grid, 2 MW, 100% solar

Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	13,125,000		13,125,000
Project life	20		
Lev. investment	656,250		656,250
Annual O&M	35		35
Annual fuelcost		-	-
Total annual cost	656,285	-	**656,285**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	-	2,628	2,628
Other			
Total CO2-eq. emission	-	2,628	**2,628**
US$/ton CO2-eq.			**250**

General inputs:		
Discount rate	0%	
Reference electricity price	0.00	US$/kWh
CO2-eq. emission coefficient	0.80	tCO2/MWh
Activity: Solar PV with battery		
Investment in PV	1500	US$/kW
O&M	35	US$/kW
Capacity factor	1642.5	Full time hours
Electricity production/kW	1642.5	kWh/year
Electricity production/kW	4.5	kWh/day
Electricity consumption whitout sun/kW	2.3	kWh/day
Unit cost of batteries	187	US$/kWh
Max. battery load	20%	
Reinvestment in batteries	3	Times
Cost of batteries	5063	US$/kW
Size of PV	2	MW
Electricity produced	3285	MWh/year
Cost of electricity produced	0.200	US$/kWh
Reference option: No solar PVs		

Parabolic through CSP, no storage, 1 MW - 2025

Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	4,500,000		4,500,000
Project life	20		
Lev. investment	225,000		225,000
Annual O&M	6,525		6,525
Annual fuelcost		-	-
Total annual cost	231,525	-	**231,525**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission		-	-
Other			
Total CO2-eq. emission	-	-	**-**
US$/ton CO2-eq.			**0.0**

General inputs:		
Discount rate	0%	
Reference electricity price	0.00	US$/kWh
CO2-eq. emission coefficient	0.00	tCO2/MWh
Reduction option: Solar central parabolic		
O&M	0.15%	Of investment
Activity	1	MW
Investment in Activity	4500	US$/kW
Capacity factor	1500	Full time hours
Electricity production	1500	MWh/year
Cost of electricity produced	0.154	US$/kWh
Reduction option: No Solar central parabolic		

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

2. Implement Energy Efficiency measures in the electricity sector

More efficient grid (loss reduction of 1 GWh)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	958 907		958 907
Project life	20		
Lev. investment	47 945		
Annual O&M			0
Annual electricity cost		0	0
Total annual cost	47 945	0	**47 945**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	0	0	0
Other			
Total CO2-eq. emission	0	0	**0**
US$/ton CO2-eq.			**0,0**

General inputs:		
Discount rate	0%	
CO2-eq. emission coefficient	0,00	tCO2/MWh
Reference electricity price	0,00	US$/kWh
Reduction option: More efficient grid		
Grid loss	15,0%	
Electricity consumption in 2025	-	GWh
Loss of production	-	GWh
Investment for 1 GWh loss reduction	0,96	MUS$/GWh
Loss reduction	#DIV/0!	GWh
Reference option: Old grid		
Grid loss	100,0%	
Loss of production	#DIV/0!	GWh

Notes:
Cost data from he CDMproject" "Energy efficiency programme in electricity distribution network in Tirupati and Puttur operational division of Andhra Pradesh" in India (Ref=8667).
Here 30.9 MUS$ was invested to reduce losses by 32.25 GWh

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

3. Replace coal and other fossil fuels with cleaner alternatives under Manufacturing and Construction Industries

Fossil fuel switch from coal to natural gas in industry (100 TJ fuel use)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	128 196		128 196
Project life	20		
Lev. investment	6 410		6 410
Annual O&M	-	-	-
Annual fuelcost	308 057	200 321	107 736
Total annual cost	314 467	200 321	**114 146**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	5 610	9 460	3 850
Other			
Total CO2-eq. emission	5 610	9 460	**3 850**
US$/ton CO2-eq.			**29,6**

General inputs:		
Discount rate	0%	
Reduction option: Natural gas use		
CO2-eq. emission coefficient	56,1	kgCO2-eq./GJ
Natural gas price	3,1	US$/GJ
Annual fuel consumption	229	TJ
Reference natural gas price	3,1	US$/GJ
Investment	0,3	Mill. US$
O&M	-	Mill. US$
Reference option: Coal use		
CO2-eq. emission coefficient	94,6	kgCO2-eq./GJ
Coal price	2,0	US$/GJ
Annual fuel consumption	229	TJ
O&M	-	Mill. US$

Notes:
Data from the CDM project: "Fuel switch project on the Gluten 20 dryer of Tongaat Hulett Starch Pty (Ltd) Germiston Mill" in South Africa (ref=3398).
Gluten 20 is a product made from drying wet milled maize.

Fossil fuel switch from fuel oil to natural gas in industry (100 TJ fuel use)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	780 942		780 942
Project life	20		
Lev. investment	39 047		39 047
Annual O&M			-
Annual fuelcost	308 057	638 192	- 330 136
Total annual cost	347 104	638 192	- **291 088**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	5 610	7 737	2 127
Other			
Total CO2-eq. emission	5 610	7 737	**2 127**
US$/ton CO2-eq.			**-136,9**

General inputs:		
Discount rate	0%	
Reduction option: Natural gas use		
CO2-eq. emission coefficient	56,1	kgCO2-eq./GJ
Reference natural gas price	3,1	US$/GJ
Annual fuel consumption	71	TJ
Investment	0,6	Mill. US$
O&M	-	Mill. US$
Reference option: Fuel oil use		
CO2-eq. emission coefficient	77,4	kgCO2-eq./GJ
Price of fuel oil	6,4	US$/GJ
Annual fuel consumption	71	TJ
O&M	-	Mill. US$

Notes:
Data from the CDM project: "Fuel oil to Natural Gas Switching at Tecnologica de Alimentos S.A. (TASA) Callao Sur Plant" in Peru.
Fish oil and fish meal factory: reduce CO2 from cooking and drying.

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

4. Introduce green or blue hydrogen and nuclear after 2035 (included to be in line with GST report) and to be determined under the National Green Hydrogen Policy under development, and implementation of electricity generation from nuclear plants as per the NIRP 2024[19]

In the absence of a corresponding mitigation option in the GACMO technology sheets, the GHG impact of this measure can be estimated as the difference between a reference (baseline) scenario based on fossil fuel technologies, and a mitigation scenario integrating low-carbon hydrogen and nuclear electricity. Aggregated emission reductions are calculated as follows:

$$ER_{total}=ER_{H2}+ER_{nuclear}$$

a) Hydrogen component (Green / Blue Hydrogen)

$$ER_{H2}=\sum_i (Q_{H2,i}\times(EF_{ref,i}-EF_{H2,i}))$$

Where:

$Q_{H2,i}$: quantity of hydrogen consumed in sector i(industry, transport, refining) [TJ or tonnes H_2] .

The end-use applications replaced (e.g. industrial heat, heavy transport, ammonia production) shall be clearly identified.

[19] NDC 3.0 (2025) https://unfccc.int/sites/default/files/2025-09/Nigeria%20NDC%203.0%20-%20Transimission%20Version%202.pdf

$EF_{ref,i}$: emission factor of the fossil-based reference technology replaced (e.g. natural gas, diesel, fuel oil) [tCO_2e/TJ]

$EF_{H2,i}$: emission factor of :

- ✔ green hydrogen (excluding upstream life-cycle emissions if not accounted)
- ✔ for blue hydrogen

.

b) Nuclear component

$$ER_{nuclear}=\sum_t (E_{nuclear,t}\times EF_{grid,ref,t})$$

Where:

$E_{nuclear,t}$: nuclear electricity generation [MWh]

$EF_{grid,ref,t}$: emission factor of the reference electricity mix or marginal generation displaced [tCO_2/MWh]

5. Emission reductions in Transport category

20% Biodiesel blended in all remaining diesel in 2025			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	0		0
Project life	20		
Lev. investment	0		0
Annual O&M	0		0
Annual fuelcost	0	0	0
Total annual cost	0	0	**0**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission		0	0
Other			
Total CO2-eq. emission	0	0	0
US$/ton CO2-eq.			**0.0**

General inputs:		
Discount rate	0%	
1 toe =	41.87	GJ
Diesel price	0.38	US$/liter
Biodiesel price	1.20	US$/liter
1 toe of diesel equal	1150	liter
1 toe of biodiesel equeal	1316	liter
Diesel emission factor	74.1	kgCO2/GJ
Reduction option: 10% Biodiesel blend		
Investment in Activity	0.00	US$/liter
M&O	0.00	US$/liter
Amount of diesel replaced	20%	
Amount of biodiesel used	0	ktoe
Amount of biodiesel used	0	m3
Reference option: 100% diesel		
Total transport diesel use in 2025	0	ktoe
Diesel replaced in transport	0	ktoe
Diesel still in use	0	ktoe
Amount of diesel replaced	0	ktoe
Amount of diesel replaced	0	GJ
Amount of diesel replaced	0	m3

15% Bioethanol blended in all gasoline in 2025			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	0		0
Project life	20		
Lev. investment	0		0
Annual O&M	0		0
Annual fuelcost	0	0	0
Total annual cost	0	0	**0**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission		0	0
Other			
Total CO2-eq. emission	0	0	0
US$/ton CO2-eq.			**0,0**

Notes:

General inputs:		
Discount rate	0%	
1 toe =	41,87	GJ
Gasoline price	0,44	US$/liter
Bioethanol price	0,83	US$/liter
1 toe of gasoline equal	1246	liter
1 toe of bioethanol equeal	2069	liter
Gasoline emissions	69,3	kgCO2/GJ
Reduction option: 15 % bioethanol blends in cars and ships		
Investment in Activity	0,00	US$/liter
M&O	0,00	US$/liter
Amount of gasoline replaced	15%	
Amount of bioethanol used	0	ktoe
Amount of bioethanol used	0	m3
Reference option: 100% gasoline in vehicles and boats		
Gasoline use in transport in 2025	0	ktoe
Gasoline replaced in other options	0	ktoe
Gasoline still in use	0	ktoe
Amount of gasoline replaced	0,0	ktoe
Amount of gasoline replaced	0	GJ
Amount of gasoline replaced	0	m3

Electric cars (1000 cars) in 2025			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	45,800,000	20,000,000	25,800,000
Project life	15	15	
Lev. investment	3,053,333	1,333,333	1,720,000
Annual O&M	458,000	200,000	258,000
Annual fuel cost	0	301,887	-301,887
Total annual cost	3,511,333	1,835,220	**1,676,113**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	0	1,597	1,597
Other			
Total CO2-eq. emission	0	1,597	**1,597**
US$/ton CO2-eq.			**1,050**

General inputs:		
Discount rate	0%	
Annual distance	12,000	km
Activity	1,000	Cars
Reduction option: Electric cars		
Investment in vehicle	40,000	US$
Investment in charging station	1,000	US$
Size of battery	40	kWh
Investment in battery	120	US$/kWh
Annual O&M	1.0%	of investment
Electricity consumption	9.0	km/kWh
Total electricity consumption	1,326	MWh
Reference electricity price	0.00	US$/kWh
CO2-eq. emission coefficient	0.00	tCO2/MWh
Emissions from electricity	-	tCO2
Economic efficiency	0.29	US$/km
Reference option: Normal gasoline cars		
Energy consumption	17.5	km/l
Investment in vehicle	20,000	US$
Annual O&M	1.0%	of investment
Gasoline price	0.44	US$/liter
Total gasoline consumption	0.69	Million liters
1000 l gasoline =	33.6	GJ
CO2-eq. emission coefficient	69.3	kgCO2-eq./GJ
Emissions from gasoline	1,597	tCO2
Economic efficiency	0.15	US$/km

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

6. Implement Energy Efficiency measures in the road transport category

More efficient diesel cars (1000 cars)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment			0
Project life			
Lev. investment	-	-	-
Reduction in subsidy	30 000	33 333	- 3 333
Annual O&M	-	-	-
Annual fuel cost	226 415	251 572	- 25 157
Total annual cost	256 415	284 906	**- 28 491**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	1617	1797	180
Other			
Total CO2-eq. emission	1617	1797	**180**
US$/ton CO2-eq.			**-158,5**

General inputs:		
Discount rate	0%	
Diesel price	0,38	US$/liter
1 toe =	41,87	GJ
1 toe of diesel equal	1150	liter
State subsidy	0,05	US$/liter
Diesel emissions	74,1	kgCO2/GJ
Reduction option: Better maintenanace		
Activity	1 000	Cars
Energy consumption	20	km/l
Annual distance	12 000	km
Total diesel consumption	0,60	Million liters
Total diesel reduction	0,1	ktoe
Emission	1 617	tCO2
Reference option: Normal maintenance		
Energy consumption	18,0	km/l
Total diesel consumption	0,67	Million liters
Emission	1 797	tCO2

Notes:

More efficient gasoline cars (1000 cars)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment			0
Project life			
Lev. investment	0	0	0
Reduction in subsidy	40,000	48,780	-8,780
Annual O&M	0	0	0
Annual fuel cost	352,201	429,514	-77,312
Total annual cost	392,201	478,294	**-86,093**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	1,863	2,272	409
Other			
Total CO2-eq. emission	1,863	2,272	**409**
US$/ton CO2-eq.			**-211**

General inputs:		
Discount rate	0%	
Gasoline price	0.44	US$/liter
1 toe =	41.87	GJ
1 toe of gasoline equal	1246	liter
State subsidy	0.05	US$/liter
Gasoline emissions	69.3	kgCO2/GJ
Reduction option: Better maintenanace		
Activity	1,000	Cars
Energy consumption	15	km/l
Annual distance	12,000	km
Total gasoline consumption	0.80	Million liters
Total gasoline reduction	0.1	ktoe
Emission	1,863	tCO2
Reference option: Normal maintenance		
Energy consumption	12.3	km/l
Total gasoline consumption	0.98	Million liters
Emission	2,272	tCO2

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

7. Modal shift for mass transit

Shifting passengers from car to rail (1Mill. personkm/day)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	927 333 333		927 333 333
Project life	40		
Lev. investment	23 183 333	0	23 183 333
Annual O&M	9 273		
Annual fuel cost	492	5 651	-5 159
Total annual cost	23 193 099	5 651	**23 187 447**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	3 514	38 972	35 458
Other			
Total CO2-eq. emission	3 514	38 972	**35 458**
US$/ton CO2-eq.			**653,94**

Notes: The Matara to Beliatte line (26 km) in Sri Lanka opened in 2019.

General inputs:		
Discount rate	0%	
Daily activity	0,3	Million pkm/day
Annual activity	109,5	Million pkm/year
Reduction option: New passenger diesel trains		
Cost of rails and trains	278,2	Million US$
Annual O&M	0,001%	
Specific consumption	0,13	MJ/pkm
Diesel price	0,38	US$/liter
1000 l diesel =	36,4	GJ
CO2-eq. emission coefficient	74,1	kgCO2-eq./GJ
Specific CO2 emission	10	gCO2/pkm
Energy consumption	14	TJ/year
Emissions	1 054	tCO2/year
Reference option: Average cars		
Occupancy	1,5	people/car
Gasoline consumption	15,0	km/l
Gasoline price	0,44	US$/liter
1000 l gasoline=	33,6	GJ
CO2-eq. emission coefficient	71,5	kgCO2-eq./GJ
Specific CO2 emission	107	gCO2/pkm
Gasoline consumption	164	TJ/year
Emissions	11 692	tCO2/year

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

8. Reducing emissions in the Aviation industry as Nigeria is exploring the adoption of Lower Carbon Aviation Fuel and Sustainable Aviation Fuel to partially replace Jet kerosene

In the absence of a dedicated GACMO technology sheet, the mitigation impact should be estimated using a fuel-switching and energy efficiency approach, combining (i) emission reductions from SAF/LCAF replacing Jet A-1, and (ii) additional operational and technical efficiency improvements, if applicable.

Fuel substitution (SAF/LCAF vs Jet Kerosene):

$$ER_{fuel} = \sum_t (FC_{SAF,t} \times (EF_{JetA1} - EF_{SAF}))$$

Where:

$FC_{SAF,t}$: quantity of SAF/LCAF consumed [TJ]

EF_{JetA1}: emission factor of conventional jet kerosene (tCO_2/TJ)

EF_{SAF}: emission factor of SAF/LCAF

Aircraft and operational efficiency:

$$ER_{eff} = \sum_t (FC_{baseline,t} - FC_{actual,t}) \times EF_{JetA1}$$

Total Emission Reductions : $ER_{total} = ER_{fuel} + ER_{eff}$

9. Adoption of efficient lighting by households

Efficient domestic lighting with CFLs (1000 bulps)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	4 042	2 500	1 542
Project life	2	2	
Lev. investment	1 721	1 250	471
Annual O&M	0	0	0
Annual electricity cost	0	0	0
Total annual cost	1 721	1 250	**471**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	#DIV/0!	#DIV/0!	#DIV/0!
Other			
Total CO2-eq. emission	#DIV/0!	#DIV/0!	**#DIV/0!**
US$/ton CO2-eq.			**#DIV/0!**

Notes:
The data is from the PDD of the CDM project "Dubai CFL Project" (789540 bulbs to 131590 Households).

General inputs:		
Discount rate	0%	
Average electricity price	0,00	US$/kWh
CO2-eq. emission coefficient	0,00	ton CO2-eq./MWh
Grid loss	100,0%	
Reduction option: Compact flourescent lanps		
O&M	0,0	US$/lamp change
Activity	1000	Bulbs
Cost of 15W eff. lamp	4,0	US$
Distribution cost	0,00	US$
Lamp lifetime	6000	hrs
Lamp wattage	15	W
Daily usage	7,00	hrs
Annual electricity used	38,3	MWh
Electricity saved	63,9	MWh
Reference option: Incandescent lamps		
O&M	0,000	US$/lamp change
Activity	1000	Bulbs
Cost of 40W incand. lamp	2,5	US$
Lamp lifetime 1	1000	hours
Lamp wattage	40	W
Daily usage	7,00	hrs
Annual electricity used	102,2	MWh

Efficient domestic lighting with LEDs (1000 bulbs)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	10 000	15 000	-5 000
Project life	3,9	3,9	
Lev. investment	2 555	3 833	-1 278
Annual O&M			0
Annual electricity cost	0	0	0
Total annual cost	2 555	3 833	-1 278
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	#DIV/0!	#DIV/0!	#DIV/0!
Other			
Total CO2-eq. emission	#DIV/0!	#DIV/0!	**#DIV/0!**
US$/ton CO2-eq.			**#DIV/0!**

Notes:
Normally an LED have had 100 Lumen/Watt.
However, it is improving with 5 Lumen/W/year, and "Ultra LEDs" are now at 140 Lumen/Watt

General inputs:		
Discount rate	0%	
Average electricity price	0,00	US$/kWh
CO2-eq. emission coefficient	0,00	ton CO2-eq./MWh
Grid loss	100,0%	
Reduction option: LEDs		
Average W of LED lamps	9,0	W
Daily usage	7,00	hrs
Annual import of bulps	1000	Bulps
Cost of LED	10	US$
Electricity for LED lighting	23	MWh/year
Reference option: Incandescent bulps		
Average W of replaced lamps	60,0	W
Lifetime of a incandescent	0,4	years
Lifetime of a LED	3,9	years
Number of replacements	10,0	
Price for an incandescent bulp	1,5	US$
Electricity for incandescent lighting	153	MWh/year
Electricity saving for 1000 lamps	**130**	**MWh/year**

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

10. Reduce emissions in the Commercial, Institutional, and Residential categories

Efficient residential air conditioner (1000 units)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	130 000		130 000
Project life	8		
Lev. investment	16 250	0	
Annual O&M	0	0	
Annual electricity cost	0	0	0
Total annual cost	16 250	0	**16 250**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	#DIV/0!	#DIV/0!	#DIV/0!
Other			
Total CO2-eq. emission	#DIV/0!	#DIV/0!	**#DIV/0!**
US$/ton CO2-eq.			**#DIV/0!**

Notes:
COP=Coefficient Of Performance = cooling capacity divided by input power Most airconditioner have input power of 9000 Btu/hr (995W) or 12000 Btu/hr (1120 W) Conventional COP from PWC Energy Audit
Efficient COP from most used efficient air conditioner

General inputs:		
Discount rate	0%	
Average electricity price	0,00	US$/kWh
CO2-eq. emission coefficient	0,00	ton CO2-eq./MWh
Grid loss	100,0%	
Reduction option: Efficient air conditioner		
O&M	0%	US$
Activity	1 000	Air conditioner
Lifetime	5	yrs
Extra cost for eff. air conditioner	130,0	US$
Cooling capacity	2,50	kW
COP	4,00	
Input power	0,63	kW
Annual usage	4 200	hrs
Annual electricity used	2625	MWh
Reference option: Conventional air conditioner		
O&M	-	US$
Activity	1000	Air conditioner
Cooling capacity	2,50	kW
COP	2,67	
Input power	0,94	kW
Daily usage	14	Hours/day
Days used	300	Days/year
Annual usage	4 200	hrs
Annual electricity used	3933	MWh
Electricity saved 1 unit	1308	MWh
Electricity saved compared to reference	0	Saving

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

11. Reduce production of charcoal

Coud be:

Efficient charcoal stoves (1000 units)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	60 000		60 000
Project life	5		
Lev. investment	12 000		12 000
Annual O&M			0
Annual fuelcost	68 328	101 125	-32 797
Total annual cost	80 328	101 125	**-20 797**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	610,2	903,2	292,9
Other			
Total CO2-eq. emission	610,2	903,2	**292,9**
US$/ton CO2-eq.			**-71,0**

Notes:
See PoA 7997 : BioLite Improved Cook stoves Programme, CPAs from Kenya.
ASB0035: Baseline woody biomass consumption for household cookstoves in Kenya
Cost from: http://afrishop.biz/product/ecozoom-super-saver-charcoal-stove-green/

General inputs:		
Discount rate	0%	
Nonrenewable fraction of wood	30%	
Calorific value of charcoal	31	MJ/kg
Cost of charcoal	0,14	US$/kg
Reduction option: Efficient efficient stove		
Number of stoves installed	1000	Stoves
Cost of stove	60	US$
Available energy for cooking	15	MJ/day
Efficiency of new Stove	37%	
Use of charcoal	1,3	kg/day
Annual charcoal consumption	0,5	t/yr
Carbon content of the charcoal	85%	
Annual carbon (C) consumed	0,6	t/yr
Reference option: Old charcoal stove		
Available energy for cooking	15	MJ/day
Efficiency of traditional Stove	25%	
Use of charcoal	1,9	kg/day
Annual charcoal consumption	0,7	t/yr
Annual carbon consumed	0,8	t/yr

Or:

Efficient charcoal production (100,000 tonnes)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	2 400 000		2400000
Project life	20		
Lev. investment	120 000		120 000
Annual O&M			0
Total annual cost	120 000	0	**120 000**
Annual emissions (tons)	Tons	Tons	Reduction
CO2-eq. emission	406 306	501 111	94 805
CH4 emissions	67 200	128 800	61 600
Total CO2-eq. emission	473 506	629 911	**156 405**
US$/ton CO2-eq.			**0,8**

General inputs:		
Discount rate	0%	
GWP for CH4	28	
Calorific value	39	MJ/m3
Non-renewable biomass	82%	
Reduction option: New process		
Size of charcoal plant	500 000	t charcoal/year
Investment	12	MUS$
CH4 emission factor	0,024	tCH4/t charcoal
Gravimetric yield	37%	charcoal/dry wood
O&M	neglectable	
Reference option: Old process		
CH4 emission factor	0,046	tCH4/t charcoal
Gravimetric yield	30%	charcoal/dry wood

Notes:
cdm.unfccc.int/DNA/fNRB/index.html gives the fraction of non-renewable biomass. ASB2 gives the CH4 emission factor (0.03) and the positive list of technologies.
Investment and and production from CDM project with Ref=4262: "Energia Verde Carbonization Project"
Positive list of technologies:

12. Adopt sustainable practices in the Oil and Gas Industry

Reduced flaring at oil field (1 MMSCF/day)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	10 866 022		10866022
Project life	20		
Lev. investment	543 301		543301
Annual O&M	434 641		434 641
Annual fuelcost		1 241 755	- 1 241 755
Total annual cost	977 942	1 241 755	**- 263 813**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission			-
Flaring of CH4		22 613	
Total CO2-eq. emission	0,0	22 613	**22 613**
US$/ton CO2-eq.			**-11,7**

General inputs:		
Discount rate	0%	
Reference natural gas price	3,1	US$/GJ
Calorific value	39	MJ/m3
CO2-eq. emission coefficient	56,1	kgCO2/GJ
Reduction option: Reduced flaring		
Investment in Activity	100	MUS$
O&M	4%	
Amount of gas flared	9,2	MMSCF/Day
Amount of gas flared	95,1	Mm3/yr
Amount of gas flared	3 710	TJ/year
Reference option: Flaring		

Notes:
The data is taken from the Project Design Document for Tres Hermanos Oil Field Gas Recovery and Utilization Project (REF=3208).
MMSCF=Million Cubic Feets.

Reduced flaring at oil refineries (1 MMSCF/day)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	26,000,000		26000000
Project life	25		
Lev. investment	1,040,000		1,040,000
Annual O&M	3,930,000		3,930,000
Annual fuelcost		1,642,750	- 1,642,750
Total annual cost	4,970,000	1,642,750	**3,327,250**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission			-
Flaring		20,797	
Total CO2-eq. emission	0.0	20,797	**20,797**
US$/ton CO2-eq.			**160.0**

General inputs:		
Discount rate	0%	
Referencenatural gas price	3.08	US$/GJ
Calorific value	39.00	MJ/m3
CO2-eq. emission coefficient	56.1	kgCO2/GJ
Reduction option: Reduced flaring		
Investment in Activity	26	MUS$
O&M	4	MUS$/year
Reference option: Flaring		
Amount of gas flared	533	TJ/year
Amount of gas flared	20,797	tCO2/year

Leak reduction in natural gas pipelines (1 million m3 CH4/year leaking)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	249,686		249686
Project life	20		
Lev. investment	12,484		12,484
Annual O&M	12,484		12,484
Annual fuelcost		120,142	-120,142
Total annual cost	24,969	120,142	**-95,174**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission			0
CH4 leaking		20,104	
Total CO2-eq. emission	0	20,104	**20,104**
US$/ton CO2-eq.			**-4.7**

General inputs:		
Discount rate	0%	
Reference natural gas price	3.1	US$/GJ
Calorific value	39	MJ/m3
Density of natural gas	0.0007180	tCH4/m3 CH4
CO2-eq. emission coefficient	77.4	kgCO2/GJ
GWP for CH4	28	
Reduction option: No leaks		
Investment in Activity	2.9	MUS$
O&M (annual monitoring)	5%	of investment
Reference option: Leaks with CH4 emissions		
Natural gas leak	1322.1	m^3 CH4/hour
Annual natural gas leak	12	Mm^3 CH4/year
Annual natural gas leak	8316	tCH4/year
Amount of gas leaking	452	TJ/year

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

6.4.4 Challenges & Data Gaps

Challenges include;

- Incomplete reporting,
- Lack of Nigeria-specific emission factors for certain fuels,
- Inconsistent data from sub-national utilities.

Gaps in historical activity data may require proxy or model-based estimates.

6.5 GHG Methods for IPPU Sector Mitigation Policies and Measures

Table 7: IPPU Sector NDC 3.0 Mitigation Measures

	NDC 3.0 PAMs	Conditionality	Status	Year of adoption	Start year of implementation
1	Reduce emissions in the cement industry	Unconditional	On-going	2015	2016
2	Reduce emissions from products used for Refrigeration and Air-Conditioning	Unconditional	On-going	2021	2022

6.5.1 Data Requirements

Activity data include production volumes of cement, steel, chemicals, and other industrial processes. Emission factors for process emissions, energy use, and by-products are needed, as well as information on process efficiency and technological improvements.

- **Activity Data Required**

Cement Industry

- Cement production (t)
- Clinker production (t)
- Clinker-to-cement ratio
- Raw material inputs (e.g. limestone consumption)

Refrigeration and Air-Conditioning (RAC)

- Consumption of HFCs by type (t/year)
- Imports and exports of refrigerants and RAC equipment
- Installed stock of RAC equipment by category
- Servicing, leakage, and end-of-life disposal data

Emission Factors and Parameters

RAC / Fluorinated Gases

- Global Warming Potentials (GWPs) of HFCs used
- Default or country-specific leakage rates
- Recovery and destruction efficiencies at end of life

6.5.2 Data Sources & Responsible Institutions

Data are obtained from the NBS, Ministry of Industry, Trade and Investment (MITI), and sector associations such as Cement Manufacturers Association of Nigeria. Industrial facilities may provide plant-specific data for higher accuracy.

6.5.3 Calculation Methodology

Methods from GACMO

1. Reduce emissions in the cement industry

Clinker replacement in cement (1000 ton cement/day)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	7,131,233		
Project life	20		
Lev. investment	356,562		356,562
Annual material cost	1,455,154	1,918,161	-463,007
Annual fuel cost	1,100,201	1,540,281	-440,080
Annual electricity cost	0	0	0
Total annual cost	2,911,917	3,458,442	**-546,525**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	51,956	72,739	20,782
Other	57,357	200,750	143,393
Total CO2-eq. emission	109,313	273,489	**164,175**
US$/ton CO2-eq.			**-3.3**

General inputs:		
Discount rate	0%	
Limestone price	3.8	US$/t
1 tonne limestone produce	0.51	t dinker
Coal price	50.0	US$/t coal
CO2-eq. emission for coal	94.6	kgCO2/GJ
Electricity price	0.00	US$/kWh
CO2-eq. emission coefficient	0.00	tCO2/MWh
CO2-eq. emission coefficient	0.786	tCO2/t clinker
Clinker production & grinding	67.95	kWh/t clinker
Firing of kiln	0.121	t coal/t clinker
Caloric value of coal	25.0	GJ/t
Reduction option: Increased blend		
Investment	14.9	Million US$
Share of clinker	50%	tClinker/tBC
Clinker production	1,044	ton dinker/day
Clinker production	381,000	ton dinker/year
Limestone use	748,393	t limestone/year
Reduction of clinker use	152,400	ton dinker/year
Use of additives	152,400	ton additives/year
Price of additives	1.2	US$/t
Reference option: Normal blend		
Cement production	2,088	ton BC/day
Share of clinker	70%	tClinker/tBC
Clinker production	1,461	ton dinker/day
Clinker production	533,400	ton dinker/year
Limestone use	1,047,750	t limestone/year

Waste heat recovery at cement plant			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	11 100 000		11 100 000
Project life	20		
Lev. investment	555 000		555 000
Annual O&M	400 000		400 000
Annual fuelcost		0	0
Total annual cost	955 000	0	**955 000**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission		0	0
Other			
Total CO2-eq. emission	0	0	**0**
US$/ton CO2-eq.			**0,0**

General inputs:		
Discount rate	0%	
Electricity price	-	US$/kWh
Reduction optiom: Heat recovery		
Activity	1	plant
Power extracted	12,27	MW
Operating time	6 690	Hours
Electricity produced	82 086	MWh
Investment	11,1	Million US$
O&M	0,4	Million US$
Reference option: No heat recovery		
Combined margin	-	tCO2/MWh
Electricity bought	82 086	MWh

Notes:
Waste Heat Recovery from the UCC RAK Waste Heat recovery Project

2. Reduce emissions from products used for Refrigeration and Air-Conditioning

c

Efficient residential air conditioner (1000 units)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	130,000		130,000
Project life	8		
Lev. investment	16,250	0	
Annual O&M	0	0	
Annual electricity cost	0	0	0
Total annual cost	16,250	0	**16,250**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	#DIV/0!	#DIV/0!	#DIV/0!
Other			
Total CO2-eq. emission	#DIV/0!	#DIV/0!	**#DIV/0!**
US$/ton CO2-eq.			**#DIV/0!**

General inputs:		
Discount rate	0%	
Average electricity price	0.00	US$/kWh
CO2-eq. emission coefficient	0.00	ton CO2-eq./MWh
Grid loss	100.0%	
Reduction option: Efficient air conditioner		
O&M	0%	US$
Activity	1,000	Air conditioner
Lifetime	5	yrs
Extra cost for eff. air conditioner	130.0	US$
Cooling capacity	2.50	kW
COP	4.00	
Input power	0.63	kW
Annual usage	4,200	hrs
Annual electricity used	2625	MWh
Reference option: Conventional air conditioner		
O&M	-	US$
Activity	1000	Air conditioner
Cooling capacity	2.50	kW
COP	2.67	
Input power	0.94	kW
Daily usage	14	Hours/day
Days used	300	Days/year
Annual usage	4,200	hrs
Annual electricity used	3933	MWh
Electricity saved 1 unit	1308	MWh
Electricity saved compared to reference	0	Saving

Efficient room air conditioner (in hotel or office etc)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	130		130
Project life	5		
Lev. investment	26	0	
Annual O&M	1	0	
Annual electricity cost	0	0	0
Total annual cost	27	0	**27**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	#DIV/0!	#DIV/0!	#DIV/0!
Other			
Total CO2-eq. emission	#DIV/0!	#DIV/0!	**#DIV/0!**
US$/ton CO2-eq.			**#DIV/0!**

Notes:
COP=Coefficient Of Performance = cooling capacity divided by input power.
Most airconditioner have input power of 9000 Btu/hr (995W) or 12000 Btu/hr (1120 W) Conventional COP from PWC Energy Audit Efficient COP from most used efficient air conditioner.
COP levels from EU labeling.

General inputs:		
Discount rate	0%	
Average electricity price	0,00	US$/kWh
CO2-eq. emission coefficient	0,00	ton CO2-eq./MWh
Grid loss	100,0%	
Reduction option: Efficient air conditioner		
O&M	1%	
Activity	1	Air conditioner
Lifetime	5	yrs
Extra cost for eff. air conditioner	130,0	US$
Cooling capacity	2,50	kW
COP for A level	3,60	
Input power	0,69	kW
Annual usage	5 110	hrs
Annual electricity used	3548,6	kWh
Reference option: Conventional air conditioner		
O&M	-	US$
Activity	1	Air conditioner
Cooling capacity	2,50	kW
COP for F level	2,70	
Input power	0,93	kW
Daily usage	14	Hours/day
Days used	365	Days/year
Annual usage	5 110	hrs
Annual electricity used	4731,5	kWh
Electricity saved 1 unit	1182,9	kWh
	25%	Saving

Efficient refrigerator (1000 units)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	648 508	389 105	259 403
Project life	10	10	
Lev. investment	64 851	38 911	25 940
Annual O&M	0	0	0
Annual electricity cost	0	0	0
Total annual cost	64 851	38 911	**25 940**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	#DIV/0!	#DIV/0!	#DIV/0!
Other		960	960
Total CO2-eq. emission	#DIV/0!	#DIV/0!	**#DIV/0!**
US$/ton CO2-eq.			**#DIV/0!**

Notes:

Promoting of Appliance of Energy Efficiency and Transformation of the

General inputs:		
Discount rate	0%	
Average electricity price	0,00	US$/kWh
CO2-eq. emission coefficient	0,00	ton CO2-eq./MWh
Grid loss	100,0%	
Reduction option: Efficient refrigerator		
O&M	0%	US$
Activity	1 000	Refrigerators
Lifetime	10	yrs
Cost of eff. refrigerator	649	US$
Refrigerator wattage	130	W
Daily usage	16	hrs
Annual electricity used	759	MWh
Reference option: Non-efficient refrigerator		
O&M	-	US$
Activity	1000	Refrigerators
ODS content in one refrigerator	0,4	kg
GWP of ODS	2 400	
Cost of old refrigerator	389	US$
Refrigerator wattage	200	W
Daily usage	16	hrs
Annual electricity used	1168	MWh
Electricity saved	**409**	**MWh**

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

6.5.4 Challenges & Data Gaps

Key challenges include lack of detailed process data, inconsistent reporting, and limited access to facility-level emissions. Sector-specific emission factors may be unavailable, requiring international defaults.

6.6 GHG Methods for Agriculture Sector Mitigation Policies and Measures

Table 10: Agriculture Sector NDC 3.0 Mitigation Measures

	NDC 3.0 PAMs	Conditionality	Status	Year of adoption	Start year of implementation
1	Upscale adoption of ranching for cattle inclusive of dairy production	Unconditional	Implemented	2019	2020
2	Improved manure management system	Unconditional	Ongoing	2019	2020

	for production of biogas				
3	Lower methane emissions from rice cultivation	Unconditional	Ongoing	2021	2022
4	Enhance mitigation through the adoption of circular economy practices within the Climate Smart Agriculture concept on 20% of cropland area	Conditional	Planned/Ongoing	2021	2022

6.6.1 Data Requirements

Required activity data include livestock population, manure management practices, crop cultivation areas, fertilizer application rates, and irrigation practices. Emission factors include methane from enteric fermentation, nitrous oxide from fertilizer application, and CO2 from land-use conversion.

Activity Data Required:

- Livestock population by type (number of cattle, goats, sheep)
- Manure management systems (m^3/year)
- Fertilizer application (kg N/ha)
- Crop area cultivated (ha), irrigation volume (m^3)

Emission Factors & Parameters:

- CH_4 EF for enteric fermentation (kg CH_4/head/year)
- N_2O EF for fertilizer (kg N_2O-N/kg N applied)
- CO_2 EF from land conversion (t CO_2/ha)
- GWP: CH_4 = 28, N_2O = 265

6.6.2 Data Sources & Responsible Institutions

Data is sourced from the Federal Ministry of Agriculture and Rural Development (FMARD), National Bureau of Statistics, research institutes, and agricultural extension services. Remote sensing may supplement data for land-use and crop distribution.

6.6.3 Calculation Methodology

Methods from GACMO

1. Upscale adoption of ranching for cattle inclusive of dairy production

Fat supplementation in ruminants diets (%DM fat added) in 2025			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment			0
Project life			
Lev. investment			0
Annual O&M	0		0
Annual fuelcost			0
Total annual cost	0	0	**0**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission			0
Other		0	0
Total CO2-eq. emission	0	0	**0**
US$/ton CO2-eq.			**80,5**

General inputs:		
Discount rate	0%	
GWP of CH4 =	28	Ton CO2
GWP of N20 =	265	Ton CO2
1 Euro=	1,15	US$
Reduction option: Use of Nitrification inhibitors		
Cost effectivenes	70	Euro/tCO2-eq
Fat added to animal feed	3	%DM fat added
1% fat added	4,0%	Reduction in CH4
Enteric fermentation of CH4	0,0	ktCO2-eq.
Reduction of CH4 emissions	0,0	ktCO2-eq.
Reference option: Normal crops		

2. Improved manure management system for production of biogas

Biogas at pig farms (1 unit)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	2 879 581		2 879 581
Project life	15		
Lev. investment	191 972		191 972
Annual O&M	420 288		420 288
Annual fuelcost		0	0
Total annual cost	612 260	0	**612 260**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	0	0	0
CH4 from manure		88 480	
Total CO2-eq. emission	0	88 480	**88 480**
US$/ton CO2-eq.			**6,920**

Notes:
Size of digester: 8500 m3 Data from the CDM project (ref=3851): "Beixu Group Methane to Energy Project" in Henan China.
Farm with 84000 pigs producing 200000 pigs/year

General inputs:		
Discount rate	0%	
Reference electricity price	0,00	US$/kWh
CO2-eq. emission coefficient	0,00	tCO2/MWh
GWP for CH4	28	
Reduction option: Biogas for electricity production		
Activity	1	biogas plant
Cost of digester & stove	2,9	Million US$
O&M	0,42	Million US$/yr
Size of generator	1,25	MW
Production of biogas	3 160	tCH4/yr
CH4 density	0,00067	t/m3
Calorific value of CH4	39,0	MJ/m3
Available energy	183 940	GJ/year
Generator efficiency	20%	
Electricity production	10 219	MWh/yr
Reference option: No biogas plant		

3. Lower methane emissions from rice cultivation

Rice crop CH4 reduction (1000 ha)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	1 337 793	26216	1311577
Project life	20	20	
Lev. investment	66 890	1311	65579
Annual O&M	-		-
Annual fuelcost			-
Total annual cost	66 890	26 216	**40 674**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission			0
Emission of CH4	5 023	8 445	
Total CO2-eq. emission	5 023	8 445	**3 422**
US$/ton CO2-eq.			**1,2**

Notes:
Irrigated, flooded fields for an extended period during the growing season.
EF (BL,c)=1.30 (kgCH4/ha/day) from IPCC 2006, volume 4, chapter 5.5, Table 5.11.
The daily emission factors are multiplied by the scaling factor Scaling factors from AMS-III.AU.
Ha/days from the CPA: "Methane avoidance in rice cultivation in SJB: 001"
No data available for costs/savings .
G. C. Nelson et al., *India Greenhouse Gas Mitigation: Issues for Indian Agriculture,* IFPRI Discussion Paper: Opportunity cost is 1.2$/tCO2e

General inputs:		
Discount rate	0%	
GWP of CH4	28	
Daily CH4 emission factor	1,3	kgCH4/ha/day
Cultivation period	200	days/year
Rice area	1000	ha
Reduction option: Rice crop with decreased irrigation		
Opportunity cost	1,2	US$/ton CO2e
O&M		
Scaling factor (double cropping)	1,73	Single aeration
Scaling factor (double cropping)	1,50	Multiple aeration
Scaling factor (single cropping)	**0,69**	Single aeration
Scaling factor (single cropping)	0,60	Multiple aeration
Daily CH4 emission factor	0,9	kgCH4/ha/day
Remember to choose the correct scaling factor		
Reference option: Nomal rice crop		
Scaling factor (double cropping)	2,88	
Scaling factor (single cropping)	**1,16**	
Daily CH4 emission factor	1,5	kgCH4/ha/day
Remember to choose the correct scaling factor		

4. Enhance mitigation through the adoption of circular economic practices within the Climate Smart Agriculture concept on 20% of cropland area

ICAT Initiative for Climate Action Transparency

Zero tillage vs. tillage on commercial farms (1000 ha)

Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment		17445	-17445
Project life		15	
Lev. investment	0	1163	-1163
Annual O&M	0	349	-349
Annual fuelcost		12000	-12000
Total annual cost	0	13512	**-13512**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	0,0	85,7	85,7
Other			
Total CO2-eq. emission	0,0	85,7	**85,7**
US$/ton CO2-eq.			**-157,6**

Notes: Data from Zimbabwe: The tractor works 15% of 240 days(1 working year) = 36 days. The tractor covers 10 acres/day = 6 ha/day e.g 36*6= 216 ha/year.

General inputs:		
Discount rate	0%	
GWP of CH4 CH4 =	28	Ton CO2
Fuel CO2 emis. factor	74,1	kgCO2/GJ diesel
Diesel price	0,38	US$/liter
Reduction option: Zero tillage		
Activity	1000	ha/year
Reference option: Normal tillage		
O&M	2%	Of investment
Activity	1	tractor
Cost of tractor + plough	25121	US$
Fraction of tractor used for tillage	15%	
Area covered by tractor	1000	ha/year
Diesel usage	31,8	l/ha
Density of diesel	0,84	t/m3
Energy content of diesel	43,33	GJ/t
Annual diesel usage	1140,6	GJ

Cover crops (1000 ha)

Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment			0
Project life			
Lev. investment			0
Annual O&M	120750	0	120750
Annual fuelcost			0
Total annual cost	120750	0	**120750**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission			0
Other		1490	1490
Total CO2-eq. emission	0	1490	**1490**
US$/ton CO2-eq.			**81.0**

General inputs:		
Discount rate	0%	
GWP of CH4 =	28	Ton CO2
GWP of N20 =	265	Ton CO2
1 Euro=	1.15	US$
Reduction option: Cover crops		
Increased soil C	1	tCO2e/ha/yr
Reduce direct and indirect N>N2O	0.49	tCO2e/ha/yr
Seed purchase	70	EUR/ha/yr
Cultivation	76	EUR/ha/yr
Reduced fertiliser purchase	-41	EUR/ha/yr
Activity	1000	ha/year
Reference option: Normal crops		

Nitrification inhibitors (1000 ha)

Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment			0
Project life			
Lev. investment			0
Annual O&M	53475		53475
Annual fuelcost			0
Total annual cost	53475	0	**53475**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission			0
Other		790	790
Total CO2-eq. emission	0	790	**790**
US$/ton CO2-eq.			**67,7**

Notes: OECD Food paper no. 89 p 27: Slowing the rate of conversion of fertiliser ammonium to nitrate. This means that the rate of conversion of nitrate to nitrous oxide (or dinitrogen) is decreased and emissions of nitrous oxide decrease.
The most used inhibitor is dicyandiamide (DCD).

General inputs:		
Discount rate	0%	
GWP of CH4 =	28	Ton CO2
GWP of N20 =	265	Ton CO2
1 Euro=	1,15	US$
Reduction option: Use of Nitrification inhibitors		
Reduction in soil N2O	0,3	tCO2e/ha/yr
Reduce direct and indirect N>N2O	0,49	tCO2e/ha/yr
Purchase of inhibitors	46,5	EUR/ha/yr
Activity	1000	ha/year
Reference option: Normal crops		

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

6.6.4 Challenges & Data Gaps

Data gaps exist due to incomplete livestock records, unreported fertilizer use, and variability in agricultural practices across regions. Estimation often relies on regional proxies or expert judgment

.6.7 GHG Methods for LULUCF Sector Mitigation Policies and Measures

Table 9: LULUCF NDC 3.0 Mitigation Measures

	NDC 3.0 PAMs	Conditionality	Status	Year of adoption	Start year of implementation
1	Increase sink capacity of national forests (25% of national area) while addressing deforestation through reduced wood removal	Unconditional	On-going	2019	2020
2	Enhance removals through the preservation and restoration of oceans and coastal ecosystems	Unconditional	Planned	2021	Not Yet

6.7.1 Data Requirements

Key data includes forest area, land-use change statistics, biomass density, carbon stock changes, and soil carbon content. Parameters such as growth rates, deforestation rates, and reforestation plans are also required.

Activity Data Required:

- Forest area (ha) by land-use category

- Biomass density (t C/ha)
- Soil carbon content (t C/ha)
- Deforestation/reforestation rates (ha/year)

Emission Factors & Parameters:

- Carbon stock change per land-use category (t C/ha/year)
- Aboveground/belowground biomass ratios
- IPCC default or country-specific carbon sequestration rates
- GWP: CO_2 = 1

6.7.2 Data Sources & Responsible Institutions

Data sources include the Federal Ministry of Environment, National Space Research and Development Agency (NASRDA), Federal and state forestry commissions, and environmental NGOs conducting field surveys or remote sensing analyses.

6.7.3 Calculation Methodology

Methods from GACMO

1 Increase sink capacity of national forests (25% of national area) while addressing deforestation through reduced wood removal

Reforestation of 1000 ha			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	600 000		600 000
Benefits (NPV)	-		
Project life	20		
Lev. investment	30 000		30 000
Annual O&M			
Annual fuelcost			
Total annual cost	30 000		**30 000**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	0	0	0
CO2 stored	-3 667		3 667
Total CO2-eq. emission	-3 667	0	**3 667**
US$/ton CO2-eq.			**8,2**

General inputs:		
Discount rate	0%	
Reduction option: Reforestation		
Investment	600	US$/ha
Annual benefit		US$/ha
Forest density	100	t dry matter/ha
Carbon fraction of dry matter	50%	
Time for forest growth	50	years
Reference option: No reforestation		

REDD for 1000 ha			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	- 403 333		- 403 333
Project life	20		
Lev. investment	- 20 167		- 20 167
Annual O&M			
Annual fuelcost			
Total annual cost	- 20 167		**- 20 167**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	0	0	0
CO2 stored	-3 667		3 667
Total CO2-eq. emission	-3 667	0	**3 667**
US$/ton CO2-eq.			**-5,50**

General inputs:		
Discount rate	0%	
Reduction option: Avoiding deforestation		
Opportunity cost	2,2	US$/tCO2
Possible future deforestation	1000	ha
Forest density	100	t dry matter/ha
Carbon fraction of dry matter	50%	
Time for forest growth	50	years
Carbon disappearing	50000	tC
Reference option: Deforestation		

Assisted regeneration of forest for 1000 ha			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	600 000		600 000
Benefits (NPV)	- 750 000		
Project life	20		
Lev. investment	- 7 500		- 7 500
Annual fuelcost			
Total annual cost	- 7 500		**- 7 500**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	0	0	0
CO2 stored	-3 667		3 667
Total CO2-eq. emission	-3 667	0	**3 667**
US$/ton CO2-eq.			**-2,0**

General inputs:		
Discount rate	0%	
Reduction option: Assisted regeneration		
Investment	600	US$/ha
Annual benefit	750	US$/ha
Forest density	100	t dry matter/ha
Carbon fraction of dry matter	50%	
Time for forest growth	50	years
Reference option: No reforestation		

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

2 Enhance removals through the preservation and restoration of oceans and coastal ecosystems

No direct GACMO option exists for this PaM. Blue carbon mitigation combines:

- Removals (sequestration) from restoration
- Avoided emissions from prevented degradation/conversion

$$ER_{total}=ER_{restoration}+ER_{avoided\ degradation}$$

Restoration component (carbon removals) : $ER_{restoration}= \sum_{i,t} (A_{i,t} \times SR_i)$

Where:

$A_{i,t}$: area restored of ecosystem type i(ha) at time t

SR_i: net carbon sequestration rate (tCO_2e/ha/year) , $SR_i=\Delta C_{biomass,i} + \Delta C_{soil,i}$

Avoided degradation component: $ER_{avoided} = \sum_{i,t} (A_{protected,i,t} \times EF_{conversion,i})$

Where:

$A_{protected,i,t}$: area of ecosystem protected (ha)

$EF_{conversion,i}$: emission factor from conversion/degradation (tCO_2e/ha)

6.7.4 Challenges & Data Gaps

Challenges include inconsistent land-use data, limited forest inventory updates, and insufficient monitoring of soil carbon. Remote sensing helps fill some gaps, but uncertainty remains high.

6.8 GHG Methods for Waste Sector Mitigation Policies and Measures

Table 10: Waste Sector NDC 3.0 Mitigation Measures

	NDC 3.0 PAMs	Conditionality	Status	Year of adoption	Start year of implementation
1	Upscale recycling activities while decreasing solid waste generation at source	Unconditional	On-going		
2	Adoption of aerated wastewater treatment system, with low-emitting technology, by industries and in urban settlements		To be implemented		

6.8.1 Data Requirements

Activity data include quantities of municipal solid waste, wastewater volumes, composition of waste, and landfill practices. Emission factors include methane potential of waste, decay rates, and energy recovery efficiencies.

Activity Data Required:

- Municipal solid waste (MSW) generation (t/year)
- Waste composition (fraction of degradable matter)
- Wastewater volume (m^3/year)
- Landfill gas capture efficiency (%)

Emission Factors & Parameters:

- CH_4 generation potential (t CH_4/t MSW)
- Decay rate constant (k, $year^{-1}$)
- N_2O emission factor for wastewater (kg N_2O/kg N)
- GWP: CH_4 = 28, N_2O = 265

6.8.2 Data Sources & Responsible Institutions

Primary sources include the Federal Ministry of Environment, State Environmental Protection Agencies, municipal waste departments, and research institutions.

6.8.3 Calculation Methodology

Methods from GACMO

1 Upscale recycling activities while decreasing solid waste generation at source

Recycling of plastics (1000 tons per year)			
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)
Total investment	303 030		303 030
Project life (years)	20		
Ann. Levelized investment	15 152		15 152
Ann. O&M	9 091		9 091
Ann. Fuelcost	-	116 638	- 116 638
Cost of plastic flakes		120 789	- 120 789
Total annual cost	24 242	237 426	**- 213 184**
Annual emissions (tons)	Tons	Tons	Reduction
Fuel CO2-eq. emission	-	833	833
CH4 emission			
Total CO2-eq. emission			**833**
US$/ton CO2-eq.			**-255,8**

General inputs:		
Discount rate	0%	
Reference diesel price	10,4	US$/GJ
Reference electricity price	0,00	US$/kWh
CO2-eq. emission coefficient	0,00	tCO2/MWh
The mitigation option: Recycling of plastic into granules		
Cost of plant	10 000	kUS$
O&M	3,0%	
Annual plastic waste received	33 000	tonnes/yr
Material loss in recycling process	25%	pct
Electicity consumption for plastic recycling	0,76	MWh/ton
Reference option: Production of plastic granules		
Electicity consumption for plastic production	1,11	MWh/ton
Diesel consumption for plastic production	15	GJ/ton
Cost of plastic flakes	121	US$/ton

Composting of Municipal Solid Waste - 1000 t/day						
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)	General inputs:		
Total investment	8 127 776		8 127 776	Discount rate	0%	
Project life (years)	15			1 tonne CH4 =	28	tonnes CO2
Ann. Levelized investment	541 852		541 852			
Ann. O&M	144 637		144 637	The mitigation option: Composting plant		
Annual income		1 268 140		MSW processed	1 000	tonnes/day
Ann. Fuelcost			-	Annual waste received	365 000	tonnes/yr
Total annual cost	686 489	1 268 140	- 581 651	Compost production	50	Tonnes/day
				Compost production	18250	Tonnes/year
Annual emissions (tons)	Tons	Tons	Reduction	Sales price of compost	56	US$/ton
Fuel CO2-eq. emission			-	Amount of recycled plastic	2000	Tonnes/year
CH4 emission		5 515 709		Sales price of plastic	121	US$/ton
Total CO2-eq. emission	-	5 515 709	5 515 709	Investment	8,1	Million US$
				O&M	7,9	US$/ton waste
US$/ton CO2-eq.			-0,11	Reference option: No composting plant		
				Organic carbon content	90%	
Notes:				Degradable organic carbon emitted	78%	
Data from the CDM project: Cu Chi Municipal Solid Waste (MSW) Treatment Plant in Ho Chi Minh City, Vietnam Project (ref=6680)				Fraction of CH4 in landfill gas	62%	(IPCCC 2006 Guideline)
				Annual waste received	365 000	tonnes/yr
				Emission factor	580,32	kgCH4/ton waste
				Fraction of Waste Disposed to SWDS	93%	
				Annual CH4 production	196 990	tonnes CH4

2 Adoption of aerated wastewater treatment system, with low-emitting technology, by industries and in urban settlements

Biogas from industrial waste water (1 unit)						
Costs in US$	Reduction Option	Reference Option	Increase (Red.-Ref.)	General inputs:		
Total investment	4 968 493		4 968 493	Discount rate	0%	
Project life	20			GWP for CH4	28	
Lev. investment	248 425		248 425	Reduction option: Biogas from waste water		
Annual O&M	198 740		198 740	O&M	4%	
Annual fuelcost		0	0	Activity	1	biogas plant
Total annual cost	447 164	0	447 164	Investment in digester	700	US$/kW
				Investment in power plant	500	US$/kW
Annual emissions (tons)	Tons	Tons	Reduction	Food production	12 000	tons/year
Fuel CO2-eq. emission	0	0	0	Waste water production	62	m3 wastewater/ton product
CH4 from sewage + manure		15 624	15 624	COD production	3	kg COD/m3 wastewater
Total CO2-eq. emission	0	15 624	15 624	CH4 production	0,25	kg CH4/kg COD
				Waste water production	744 000	m3/year
US$/ton CO2-eq.			28,6	Biogas production factor	20	m3 biogas/m3-sewage
				CH4 content in the biogas	60%	
Notes:				CH4 production factor	0,75	kg CH4/m3 wastewater
We are lookin at a biogas plant at a agricultural industry producing milk and other diary product. The input into the biogas plant is the sewage water from the industry plus the manure from the cows at the site.				Annual CH4 production	8 928 000	m3 CH4
				CH4 density	0,67	kg/m3
				CH4 calorific value	39	MJ/m3
				Annual gas production	348 192	GJ
				Generator elec. efficiency	0,30	
				Electricity produced	29 016	MWh
				Capacity factor	0,80	
				Size of generator	4 140	kW
				Reference option: Electricity prodcuced at grid		
				Electricity price	0,00	US$/kWh
				CO2-eq. emission coefficient	0,00	tCO2/MWh
				Electricity produced	29 016	MWh

For details on how to further apply the GACMO Tool, refer to GACMO tool - UNEP-CCC.

6.8.4 Challenges & Data Gaps

Data challenges include underreporting of waste volumes, variability in composition, and limited monitoring of methane capture projects. Many smaller municipalities lack consistent records, necessitating assumptions or proxy data.

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Table 11: GACMO INDICATOR TRACKING SHEET TO CALCULATE THE GHG EMISSION REDUCTION

In this sheet the country will follow the implementation of the GHG reduction options in the mitigation c			Plan			Implemented mitigation options/units (excluding those implemented before and during the start year, and including those implemented in the years following start year, depending on the lifetime of the mitigation measure)														Assessment of progress, %		
Type	Reduction option	Sub-type unit	2025 plan	2030 plan	2035 plan	2021 Actual	2022 Actual	2023 Actual	2024 Actual	2025 Actual	2026 Actual	2027 Actual	2028 Actual	2029 Actual	2030 Actual	2031 Actual	2032 Actual	2033 Actual	2034 Actual	2035 Actual	Progress up to 2025 (compared to planned in 2025)	Progress up to 2030 (compared to planned in 2030)	Progress up to 2035 (compared to planned in 2035)
Agriculture	Rice crop CH4 reduction	Rice crop CH4 red.(1000 ha)	0	0	0																		
	Zero tillage	1000 ha	0	0	0																		
	Cover crops	1000 ha	0	0	0																		
	Nitrification inhibitors (1000 ha)	1000 ha	0	0	0																		
	Covering slurry stores (1 slurry store)	1 slurry store	0	0	0																		
	Fat supplementation in ruminants diets (%DM fat add	%DM fat added	0	0	0																		
	Tobacco curing	100 t tobacco/yr	0	0	0																		
Biomass energy	Rice husk cogeneration plants	1 MW cogeneration	0	0	0																		
	Biomass power from biomass residues	1 MW CHP plant	0	0	0																		
	Bagasse power	100 kt sugar cane/year	0	0	0																		
CCS	CCS plant	1 MW	0	0	0																		
Cement	Clinker replacement	1000 tonnes cement/day	0	0	0																		
Coal bed/mine methane	Coal mine methane	10 Mm3 CMM/year	0	0	0																		
EE households	Efficient residential airconditioning	1000 Airconditioners	0	0	0																		
	Efficient lighting with CFLs	1000 Bulps	0	0	0																		
	Efficient lighting with LEDs	1000 Bulps	0	0	0																		
	Efficient lighting with LEDs replacing CFL	1000 Bulps	0	0	0																		
	Efficient wood stoves	1000 stoves	0	0	0																		
	Efficient charcoal stoves	1000 stoves	0	0	0																		
	LPG stoves replacing wood stoves	1000 stoves	0	0	0																		
	Efficient electric stoves	1000 stoves	0	0	0																		
	Induction based cooking	1000 stoves	0	0	0																		
	New passive home	1000 new homes	0	0	0																		
	Efficient refrigerators	1000 refrigerators	0	0	0																		
EE industry	Efficient electric motors	1 kW	0	0	0																		
	Energy efficiency in industry	10% red. of energy demand	0	0	0																		
	Building materials	1 million bricks	0	0	0																		
EE own generation	Waste heat recovery at cement plant	1 Cement plant	0	0	0																		
	Waste heat recovery at steel plant	1 Steel plant	0	0	0																		
EE service	Efficient electric motors	1 kW	0	0	0																		
	Efficient office lighting with CFLs	1000 lights	0	0	0																		
	Efficient office lighting with LEDs	1000 lights	0	0	0																		
	Efficient street lights	1000 lights	0	0	0																		
	Efficient water pumping	4 Million m3 water	0	0	0																		
	HVAC	100,000 m2 floor area	0	0	0																		
	Efficient Chiller > 300 TR	1 TR	0	0	0																		
	Efficient Chiller < 300 TR	1 TR	0	0	0																		
	Efficient room airconditioner	1 Airconditioner	0	0	0																		
	Efficient commercial dishwashing machine	1000 meals/day	0	0	0																		
	Efficient hotel refrigerator	1 refrigerator	0	0	0																		
	Efficient hotel washing machine	100 Guest Nights (GN)	0	0	0																		
	Energy efficiency in service	10% red. of energy demand	0	0	0																		

7.Operational guidelines for NDC tracking

7.1 Filling CTFs related to tracking progress made in implementing Nigeria NDC global target

This subchapter provides operational guidance for compiling and reporting the information necessary to track progress made in implementing and achieving Nigeria's NDC 3.0 global target, in line with the Enhanced Transparency Framework of the Paris Agreement.

1. **Reporting provision : Paragraphs 59-63 - National circumstances and institutional arrangements**

Table 12: Reporting provision: Paragraphs 59-63

Paragraph(s) of the MPGs	Heading	Format of reporting	Related CTF
Paragraphs 59-63	A. National circumstances and institutional arrangements	Information to be reported in a narrative format	Not applicable

In a nutshell

This reporting provision requires a descriptive report on how Nigeria's unique national context and governance structures influence its ability to implement its NDC. The reporting should explain:

- **National circumstances (Para 59-60):** How Nigeria's government structure, population, geography, economy, and climate profile affect both its GHG emissions and its capacity for climate action. For example, describe how economic diversification efforts or rapid urbanization trends impact emission trajectories.
- **Institutional arrangements (Para 61-62):** The institutional framework for tracking NDC progress. This includes identifying lead agencies, their roles, and procedures for data collection, monitoring, reporting, and verification, and stakeholder engagement. It is recommended to reference any legal or administrative frameworks that support NDC implementation.

a. **Approach:**

Various national circumstances affect a Party's ability to implement and achieve its NDC under Article 4 of the Paris Agreement, including its government structure, features of its population profile, geography, economy and climate, and sector-specific details.

Well-functioning institutional arrangements are vital to enabling countries to collect, process and provide reliable, comprehensive and regularly updated information that meets the enhanced reporting requirements and serves national decision makers and relevant stakeholders.

The reporting requirements related to national circumstances and institutional arrangements are contained in paragraphs 59-63 of the MPGs, reproduced below. Examples of information to be reported to meet each requirement are also provided below.

i. **Paragraph 59: Each party shall describe its national circumstances relevant to progress made in implementing its NDC under Article 4 of the Paris Agreement,** including:

- Government structure;
- Population profile;
- Geographic profile;
- Economic profile;
- Climate profile;
- Sector details.

- As national circumstances are, by definition, country-specific, a Party can report any information that is relevant to the implementation and achievement of its NDC.
- Information reported to meet this requirement could include, for example, how political authority on matters relating to climate policy is delegated to different levels of government or how a primarily export-based agricultural economy may make it challenging to meet emission reduction commitments.

ii. **Paragraph 60: Each Party shall provide information on how national circumstances affect GHG emissions and removals over time.**

- Information reported to meet this requirement could include, for example, how an increasingly urbanized population is able to achieve reduced GHG emissions in the transport sector or how harsh climatic conditions may affect the need for heating or cooling, thus affecting GHG emission trends over time.

iii. **Paragraph 61: Each Party shall provide information on the institutional arrangements in place to track progress made in implementing and achieving its NDC under Article 4, including those used for tracking internationally transferred mitigation outcomes, if applicable, along with any changes in institutional arrangements since its most recent biennial transparency report.**

- Information reported to meet this requirement could include, for example, government requirements to assess the GHG impacts of policy proposals; requirements to measure, monitor and report on the GHG impacts of activities undertaken by government agencies; requirements for periodic reporting on progress in achieving GHG emission reduction objectives; and policies on the use of international market mechanisms, including the tracking of any units obtained and/or sold.

iv. **Paragraph 62: Each Party shall provide information on legal, institutional, administrative and procedural arrangements for domestic implementation, monitoring, reporting, archiving of information and stakeholder engagement related to the implementation and achievement of its NDC under Article 4.**

- Information reported to meet this requirement could include, for example, legislative arrangements and enforcement and administrative procedures, such as overarching national measures relevant to climate change; decrees, regulations and governmental decisions on the implementation of climate-related measures; and environmental laws, acts and regulations related to stakeholder consultation.

v. **Paragraph 63: In reporting the information referred to in paragraphs 59-62 above, a Party may reference previously reported information.**

- Information could be previously reported in, for example, biennial reports.

b. Data requirements and sources:

- **Data:** Descriptive information on governance, demographics, economic sectors (e.g., oil & gas, agriculture,…), climate vulnerabilities, and institutional mandates.
- **Sources:** National census data, economic surveys (e.g., from the National Bureau of Statistics), policy documents (e.g., National Climate Change Policy), government gazettes, and organizational charts of relevant ministries and agencies (e.g., Federal ministry of environment, National Council on Climate Change,…).

c. Annual data collection and validation process:

This is not primarily numerical data. The information is compiled by policy experts from relevant ministries. It should be reviewed and updated for each Biennial Transparency Report through inter-ministerial consultations to ensure accuracy and completeness.

d. Data quality assurance and control procedures:

- Cross-referencing information from official government publications.
- Internal review by the National Council on Climate Change or designated coordinating body.
- Validation through stakeholder workshops with civil society and academia.

e. Data flow diagram:

[Relevant ministries/agencies] -> [Draft narrative] -> [NCCC for compilation/review] -> [Final BTR chapter]

f. International best practices:

- Providing a clear, concise narrative that directly links national circumstances to NDC implementation challenges and opportunities.

- Referencing previously reported information (e.g., from National Communications) to avoid duplication, as permitted by Paragraph 63.

g. Examples from other countries:

Country	Relevant section of the BTR	Pages
European Union	Please refer to section "3.1 National circumstances and institutional arrangements"	Page 19 to page 38
Switzerland	Please refer to section "II.A National circumstances and institutional arrangements"	Page 8 to page 52

h. Template for data submission and review:

A standard document template should be used, with sections corresponding to Paragraphs 59-63, prompting officers to provide the required descriptive information.

2. **Reporting provision: Paragraph 64 - Description of a Party's NDC**

Paragraph(s) of the MPGs	Heading	Format of reporting	Related CTF
Paragraph 64	B. Description of a Party's NDC under Article 4 of the Paris Agreement, including updates	Information to be reported in a narrative and common tabular format	Appendix: Description of a Party's NDC (to be used by Parties on a voluntary basis.)

In a nutshell: how to fill-in appendix on description of a Party's NDC

- For submitting information on description of a Party's NDC, a pre-defined reporting format is available. It can be found in the appendix to Annex II of the transparency guidance.
- The use of this reporting format is voluntary, and Parties may alternatively provide the related information in a freely chosen format in their Biennial Transparency Report. However, it is recommended that the defined reporting format is used because it helps country experts to ensure that all required elements are included. It also helps readers and reviewers to understand this information, and it may reduce the number of questions raised during the review process.
- Parties with both unconditional and conditional targets in their NDC may add a row to the table to describe conditional targets

- The reporting format allows for entering a combination of numerical and textual information. For some targets, a more detailed structure of the table would be more helpful. However, the table was designed in a rather generic way to ensure that the same table accommodates all types of NDCs. If additional explanations are needed to fully describe the target, such information can be provided in the Biennial Transparency Report.

The voluntary tabular format is highly recommended to ensure clarity and comparability. The table must be populated with the following elements from Nigeria's NDC 3.0:

- **Target(s) and description:** e.g., " achieving net-zero emissions by the year 2060", " 29.3% reduction in 2030 and a 32.2% reduction in 2035 compared to the 2018 baseline", "20% unconditional objective and 80% conditional reduction at 80% of the 29% and 32% reduction of the estimated 2018 emissions in 2030 and 2035, respectively".
- **Target year/period:** e.g. 2035.
- **Reference point:** e.g. reference year 2018.
- **Time frame for implementation:** e.g. 2026-2035.
- **Scope and coverage:** e.g. Sectors (Energy, IPPU, Agriculture, LULUCF, Waste) and gases (CO_2, CH_4, N_2O, HFCs) covered.
- **Intention to use ITMOs:** State Nigeria's position on using internationally transferred mitigation outcomes.
- **Updates or clarifications:** Note any recalculations or updates from the initial NDC submission.

This section provides a clear and complete description of Nigeria's NDC against which progress will be tracked.

a. Approach:

As part of the information necessary to track progress in implementing and achieving NDCs under Article 4 of the Paris Agreement, Parties are required to provide a **description of their NDC**, including information on the nature of the NDC, relevant reference points and values; the time frame for implementation; scope and coverage; intention to use units under Article 6; and any updates or clarifications. This information will be used to track progress in implementing and achieving the NDC.

The entire reporting requirements related to the description of the NDC are contained in paragraph 64 of the MPGs. Depending on NDC target type, information should be provided in the BTR on the following elements presented in table below.

Table 13: Information to be provided in the BTR on the description of the NDC and similar information to be provided in the NDC.

BTR[a] requirements	Related NDC requirements[b]
Target(s) and description (see examples in Table 12)	General description of the target
	Target relative to the reference indicator, expressed numerically (e.g. in % or amount)
Target year(s) or period(s), and whether they are single-year or multi-year target(s)	Whether it is a single-year or multi-year target
Reference point(s), level(s), baseline(s), base year(s) or starting point(s) and their respective value(s)	Reference year(s), base year(s), reference period(s) or other starting point(s)
Time frame(s) and/or periods for implementation	Time frame and/or period for implementation, including start and end dates
Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases	Sectors, gases, categories and pools covered by the NDC
	Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans
Intention to use cooperative approaches that involve the use of ITMOs in relation to the NDC	Intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable
Any updates or clarifications of previously reported information	Information on the circumstances under which the Party may update the values of the reference indicators

The information on a Party's NDC constitutes a special case because the MPGs do not explicitly require this information to be provided in a common tabular format. In Glasgow, Parties agreed on a tabular format for the description of a Party's NDC, but it was added as an appendix to Annex II and a note was included stating that this table is to be used by Parties on a voluntary basis.

The use of this tabular format for information on the Party's NDC will facilitate the understanding of the information in the BTR as well as the technical expert review. This situation is comparable to the reporting of 'information to facilitate, clarity, transparency and understanding of NDCs' (annex I to decision 4/CMA.1). While such information is mandatory from the second NDC only, many Parties provided it when they updated their first NDCs in 2020/2021, and many decided to provide this information in a tabular format.

The detailed information to be reported to meet the requirements is provided below.

Paragraph 64: Each Party shall provide a description of its NDC under Article 4, against which progress will be tracked. The information provided shall include the following, as applicable, including any updates to information previously provided:

a) Target(s) and description, including target type(s) (e.g. economy-wide absolute emission reduction, emission intensity reduction, emission reduction below a projected baseline, mitigation co-benefits of adaptation actions or economic diversification plans, policies and measures, and other)

The reported information shall include, as applicable, a description of the target explaining the nature of the target. For example, for **absolute emission reduction relative to a base year** as it is the case for Nigeria NDC 3.0 global target, it is expressed as an emission reduction from the level in a specified base year. These targets may be economy-wide or sector-specific. They can reflect a decrease in emissions compared with a base-year period. They can also take the form of a target for carbon neutrality. The Paris Agreement specifies that developed country Parties should undertake economy-wide emission reduction targets, while developing country Parties are encouraged to move over time towards economy-wide emission reduction or limitation targets.

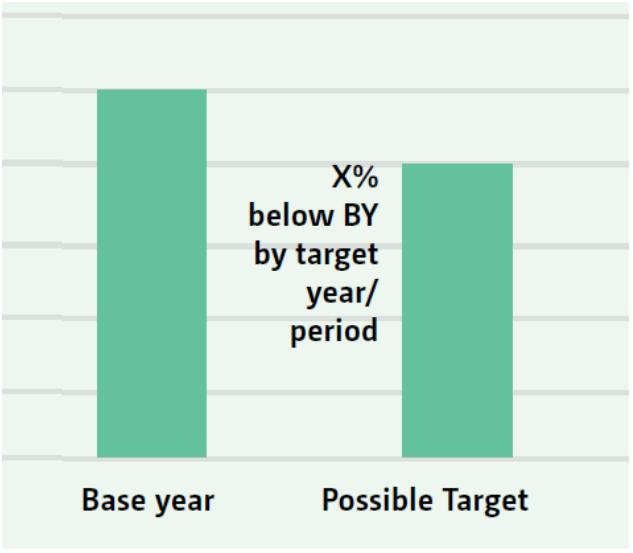

Figure 6. Example of an emission reduction target and a limitation on emissions compared with a base-year or period

b) Target year(s) or period(s), and whether they are single-year or multi-year target(s)

- The reported information shall include, as applicable, information indicating the target year(s) or period(s) of the NDC.

- In addition, the Party is required to indicate whether the target is intended to be met in a **single year** or over **multiple years**.

- A single-year target means that emissions must be reduced below the target level in a specific year. For example, if a Party's NDC includes a single-year target by which it pledges to reduce emissions by 30 per cent below the 2005 level in 2035, the Party would need to provide information on the expected emission level in 2035 only.
- In contrast, a multi-year target means that total cumulative emissions must remain below the target level over the entire period of NDC implementation. For example, if a Party has a multi-year target as part of its NDC by which it pledges to reduce emissions by 40 per cent below the 1990 level, the Party will need to provide information on emission levels in each year of the period of implementation (i.e. start date to the target year).

- Multi-year targets may involve either an averaging of emissions across the implementation period or an absolute cumulative emission target over the period. Multi-year targets may also be referred to as "budget" approaches.
- Alternatively, a multi-year target could also mean that the Party has a target for several consecutive years (e.g. 2025, 2030 and 2050) because it will implement different policies and measures over different time periods.

c) Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s)

- The reported information shall include, as applicable, information on any reference point(s), level(s), baseline(s), base year(s), or starting point(s), and their respective values.
- This information will be used to track progress of implementation of the NDC.
- When providing information on reference point(s), the type of information to be reported depends on the type of target and approach(es) being used.

Type of information to be reported by Parties according to target type

- **Absolute emission reduction targets**

- Emission levels for the base and target year in terms of CO_2eq
- Headline number (percentage) of emission reduction

- **‘Business as usual’ targets**
  - Emission levels for the base and target year in terms of CO_2eq
  - Headline number (percentage) of emission reduction
  - Assumptions used and sources for data series that form part of the NDC target (e.g. GDP, population, energy use, type of model used if NDC is based on projected values, past trends)
  - Model used to develop ‘business as usual’ baseline
  - Whether the baseline scenario is static or dynamic
  - Which policies and measures are included/excluded in the baseline, and on what basis (e.g. does the baseline include policies and measures adopted up to a specific point in time?)
- **Intensity targets**
  - Quantified target level of emissions or emission reduction per unit of GDP, unit of product/output or population, or another indicator
  - Base and target years
  - Intensity level for the base year, as well as past trends and projections (if available)
  - Headline number (percentage) of emission reduction
  - Expected emission level for the target year
- **Targets based on policies and measures**
  - Detailed list of intended and proposed policies and measures
  - Description of actions, including mitigation co-benefits
  - Qualitative description of policies and measures
  - Quantitative information on expected emission reductions from the policies and measures (if possible)
  - Explanation of how progress will be tracked (e.g. quantification, status of implementation of policies and measures)
- **Emission peaking targets**
  - Peak year
  - Indicators to be used to assess whether the target has been met
  - Estimated emission level in the peak year
  - Emissions trajectory towards peak year

- Expected emissions trajectory after peak year

d) Time frame(s) and/or periods for implementation

- The reported information shall include, as available, information on the time frame and/or period of implementation, which refers to the time by which or in which the NDC is to be achieved.
- According to UNFCCC 2022 NDC Synthesis Report, 92 per cent of NDCs have a time frame and/or period of implementation of until 2030 while 8 per cent of NDCs have specified periods until 2025, 2035, 2040 or 2050.
- As regards the starting date, according to the same report, 55 per cent of NDC have 1 January 2021 as a starting date: 31 per cent in or before 2020 and 3 per cent starting implementation in 2022.

Examples of target time frames

- Party X has indicated a starting date of 1 January 2026 and an implementation period up until 31 December 2035;
- Party Y has indicated a starting date of 1 January 2031 and an implementation period up until 31 December 2035.

e) Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases;

- The reported information shall include, as available, information describing the scope and coverage of the NDC.
- Sectors and greenhouse gases covered by Parties that communicated their NDC

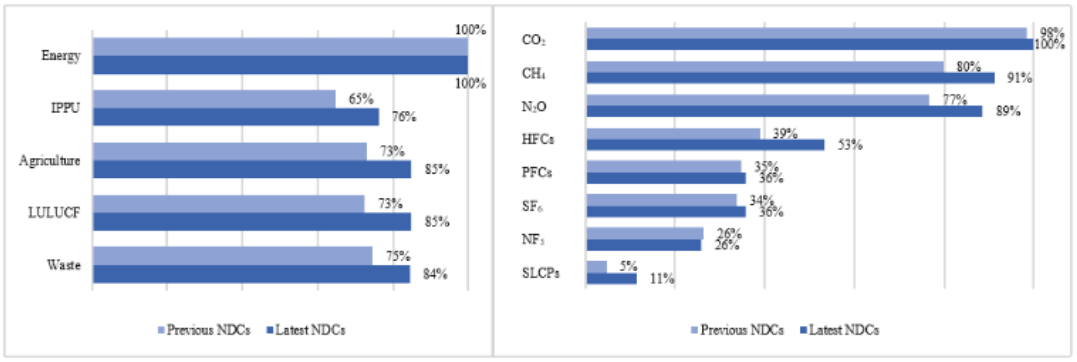

Figure 7. Sectors and greenhouse gases covered by Parties

Example of description of NDC scope and coverage from a Party's revised NDC:

Sectors, gases, categories and pools covered by the nationally determined contribution, including, as applicable, consistent with Intergovernmental Panel on Climate Change (IPCC) guidelines	The sectors, gases, categories and pools covered by the UK's NDC are based on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, the 2013 IPCC Kyoto Protocol Supplement and the 2013 IPCC Wetlands Supplement. The UK also looks forward to implementing methodologies introduced by the 2019 Refinement to the 2006 IPCC Guidelines in the future. **Sectors covered** Energy (including transport); Industrial Processes and Product Use (IPPU); Agriculture; Land-use, Land-Use Change and Forestry (LULUCF); and Waste. **Gases covered** CO2, CH4, N2O, HFCs, PFCs, SF6 and NF3. **Pools covered** All LULUCF pools are included in the NDC: above ground biomass, below ground biomass, litter, deadwood soil organic carbon and stocks of harvested wood products.

f) Intention to use cooperative approaches that involve the use of internationally transferred mitigation outcomes under Article 6 towards NDCs under Article 4 of the Paris Agreement

- To fulfil this requirement, any Party intending to use internationally transferred mitigation outcomes acquired through cooperative approaches to meet its NDC must indicate this in the BTR.
- As part of tracking progress, additional information on participation in Article 6 is required to be reported, including in CTF tables 3 and 4.

g) **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)**

The reported information shall include, as available, any updates or clarifications from previously reported information. For example:

- A recalculation of previously reported inventory data that results in a change in the base year emissions which, in turn, affects the quantification of emission reductions needed to meet the target;
- Recalculation of BAU emissions and removals;
- Updated information on methodologies;
- Additional information on the use of cooperative approaches.

b. Data requirements and sources:

- **Data:** All elements listed above, directly extracted from the official NDC 3.0 document.
- **Sources:** The submitted NDC 3.0 document and any supporting technical reports used to develop the mitigation scenario and targets.

c. Annual data collection and validation process

This is a one-time setup for the NDC period. The data is sourced directly from the NDC document. It should be verified during the BTR preparation to ensure the description in the report matches the original NDC submission

d. Data quality assurance and control procedures

- Direct extraction from the official, UNFCCC-submitted NDC 3.0 document.
- Technical review by the team that developed the NDC to ensure accurate representation.

e. Data flow diagram

[NDC 3.0 document] -> [Extraction into tabular format] -> [Technical review] -> [Inclusion in BTR]

f. International best practices

- Using the voluntary table format to enhance transparency and facilitate review.

- Providing a clear mitigation scenario description, including key drivers and models used.

g. Examples from other countries

Table 14: Filled CTF table "Appendix: Description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates" for Switzerland BTR1

	Description
Target(s) and description, including target type(s), as applicable[b, c]	Absolute economy-wide emission reduction target compared with a base year. Emission reduction of at least minus 50 percent by 2030 compared with 1990 levels, implemented as an emission budget covering 2021–2030, which is equivalent to an average reduction of net greenhouse gas emissions of at least 35 percent over the period 2021–2030.
Target year(s) or period(s), and whether they are single-year or multi-year target(s), as applicable	01.01.2021–31.12.2030 Switzerland expresses its first NDC both as single-year (2030) and multi-year target (2021–2030). The single-year target is implemented using an emission budget over the period 2021–2030.
Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s), as applicable	Base year: 1990 Emissions in the base year comprise net emissions and net removals from all sectors (including LULUCF) and indirect CO2. A provisional value for base year emissions, subject to change due to recalculations of the greenhouse gas inventory, is 52.1 million tonnes of CO2 equivalents (based on the National Inventory Report from April 2024). The value for the final accounting will be defined in the first inventory submission covering data up to 2030. LULUCF will be reported and accounted for on a land-based approach.
Time frame(s) and/or periods for implementation, as applicable	01.01.2021–31.12.2030
Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases, as applicable	Gases covered: CO2 (including indirect CO2), CH4, N2O, HFCs, PFCs, SF6, NF3 Sectors covered (as reported in the national inventory report): energy; industrial processes and product use; agriculture; land-use, land-use change and forestry; waste; other. While Switzerland supports the inclusion of international aviation and navigation on the basis of existing and future internationally agreed rules applicable to all Parties, Switzerland's first NDC does not include emissions from international aviation and navigation. In particular, Switzerland's emission reduction targets up to 2030 do not include

	emissions from international aviation, a part of which are already covered by the Swiss emission trading scheme (ETS) as well as by the Carbon Offsetting and Reduction Scheme CORSIA of the International Civil Aviation Organisation ICAO. However, Switzerland's long-term emissions reduction targets do include emissions from international aviation and navigation.
Intention to use cooperative approaches that involve the use of ITMOs under Article 6 towards NDCs under Article 4 of the Paris Agreement, as applicable	Switzerland will realize its first NDC mainly domestically and will partly use internationally transferred mitigation outcomes (ITMOs) from cooperation under Article 6. Switzerland will implement the guidance on cooperative approaches referred to in Article 6, paragraph 2 of the Paris Agreement, adopted at COP26, as well as further guidance to be adopted on Article 6, to apply robust rules that avoid any form of double counting, ensure environmental integrity and promote sustainable development, including the protection of human rights, and not to use pre-2020 units towards the achievement of its first NDC. Switzerland already signed bilateral agreements with various countries (see www.bafu.admin.ch/bilateral-climate-agreements), creating the necessary frameworks for cooperative approaches under Article 6.2 of the Paris Agreement. The agreements govern the transfers of mitigation outcomes and their use. ITMOs may also be used for other international mitigation purposes, such as e.g. voluntary climate targets by private or sub-state actors. In this case, they would not be counted towards Switzerland's NDC.
Any updates or clarifications of previously reported information, as applicable[d]	As Switzerland consistently uses the values from the most recent greenhouse gas inventory, any recalculations in the greenhouse gas inventory potentially affect the values for the base year (1990) as well as for the years included in the period for implementation. Switzerland's national inventory document annually provides an overview of the most relevant recalculations in chapter 10, while the sectoral chapters document each individual recalculation. The LULUCF sector will be reported and accounted for based on a land-based approach. In order to foster environmental integrity and to reduce uncertainty due to assumptions regarding extrapolated management practices and other parameters influencing the calculation of reference levels, Switzerland decided to use net accounting of emissions and removals in the LULUCF sector from 2021 onwards. This change in the accounting method has also been introduced in the national legislation (CO2 ordinance).

h. Template for data submission and review

The predefined "Appendix: Description of a Party's NDC" from Annex II of the transparency guidance should be used as the template. The table below provides a filled-in reporting format, for an example using a base year target.

Table 15: Example of a filled-in appendix to Annex II of the transparency guidance

Item	Description
Target(s) and description, including target type(s), as applicable	Economy-wide net greenhouse gas emission reduction of 20% by 2030 compared to the base year 2005 Target Type: economy-wide emission reduction target
Target year(s) or period(s), and whether they are single-year or multi-year target(s), as applicable	Target year: 2030 Single-year target
Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s), as applicable	Reference level: Economy-wide net greenhouse gas emissions and removals in 2005 Value: 100 Mt CO_2e
Time frame(s) and/or periods for implementation, as applicable	Period for implementation: 2021-2030
Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases, as applicable	Sectors: Energy, industrial processes and product use, agriculture, land use, land use change and forestry, waste Coverage: All emissions and removals on the national territory Gases: CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3
Intention to use cooperative approaches that involve the use of ITMOs under Article 6 towards NDCs under Article 4 of the Paris Agreement, as applicable	The Party does not intend to use cooperative approaches

Any updates or clarifications of previously reported information, as applicable	The reference level has been updated due to recalculations in the national greenhouse gas inventory. The value communicated in the NDC was 101 Mt CO_2e. The updated reference level (emissions level in the base year) is 100 Mt CO_2e.

3. **Reporting provision: paragraphs 65-79 of MPGs - Information necessary to track progress made in implementing and achieving NDC**

Table 16: Reporting provision: paragraphs 65-79 of MPGs

Paragraph(s) of the MPGs	Heading	Format of reporting	Related CTF
Paragraphs 65-79	C. Information necessary to track progress made in implementing and achieving its nationally determined contribution under Article 4 of the Paris Agreement	Information to be reported in a narrative and common tabular format	• CTF table 1 Description of selected indicators. • CTF table 2 Definitions needed to understand NDC. • CTF table 3 Methodologies and accounting approaches. • CTF table 4 Tracking progress in implementing and achieving the NDC • CTF12 Information necessary to track progress on the implementation and achievement of the domestic policies and measures implemented to address the social and economic consequences of response measures

In a nutshell

This section is the core of progress tracking and is based on a 5-step approach using self-determined indicators, as detailed in the MPGs:

1. **Identification of indicators (CTF table 1):** For Nigeria's economy-wide absolute emission reduction target (relative to a base year), the primary indicator will be **"Total GHG emissions covered by the NDC"** (in kt CO_2eq).
2. **Provision of reference values (CTF table 1):** For the wide absolute emission reduction target, the reference value is the **emissions level for the base year (2018)**.
3. **Provision of a time series (CTF table 4):** Report a full time series of the indicator values from the start of the implementation period (2026) up to the most recent reporting year. This includes the GHG inventory data aligned with the NDC's scope.
4. **Comparison with reference value (CTF table 4):** For each reporting year, compare the most recent indicator value with the reference value. For Nigeria NDC 3.0 global target, this involves calculating the percentage reduction achieved so far against the reference value of the base year (2018).
5. **Assessment of progress (CTF table 4):** Based on the comparison and the trend in the time series, assess whether Nigeria is on track ("making progress") or not ("not making sufficient progress") towards its NDC target.

Supporting information (CTF tables 2 & 3):

- **Definitions (CTF table 2):** Provide clear definitions for all indicators and terms used that are specific to Nigeria's NDC.
- **Methodologies (CTF table 3):** Describe the methodologies used for accounting and calculating indicators. Reference the relevant sections of the National Inventory Document and BTR.

a. Approach

Tracking progress in implementing and achieving NDCs is based on self-determined indicators selected by Parties. Indicators may be quantitative or qualitative but must be relevant to a Party's NDC.

For each selected indicator, a Party shall provide:

1. The information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), and shall update the information in accordance with any recalculation of the GHG inventory, as appropriate;

2. The most recent information for each reporting year during the implementation period of its NDC

Parties track progress by comparing information on indicators during the implementation period of the NDC with the information for the reference points that correspond to the NDC targets.

The use of indicators is a novel approach for tracking progress in implementing and achieving NDCs under the ETF, developed and agreed by Parties primarily to accommodate the various types of NDC targets.

Tracking progress in implementing and achieving NDCs involves an understanding of:

- Levels and trends of the indicators a Party has chosen on the basis of its NDC targets;
- Progress achieved during the implementation period;
- Additional actions, if any, are needed to reach the NDC targets;
- The likelihood of achieving the NDC targets during the implementation period;
- Whether the NDC target was achieved.

Furthermore, in addition to the target and indicator values, countries shall describe each methodology and/or accounting approach used to define the targets, construction of baselines and each indicator, including key parameters, assumptions, definitions, data sources and models used, IPCC guidelines and metrics used. Information on applied methodologies is also requested for countries whose targets include the implementation of policies and measures, and the use of cooperative approaches that involve the use of ITMOs. Countries shall also explain how the methodology in each reporting year is consistent with the methodology or methodologies used when communicating with the NDC, explain any methodological inconsistencies with the Party's most recent NIR, if applicable, and describe how the double-counting of net GHG emissions reductions has been avoided.

For the first NDC, each Party shall clearly indicate and report its accounting approach, including how it is consistent with Article 4, paragraphs 13 and 14, of the Paris Agreement. Parties may choose to apply accounting guidance contained in decision 4/CMA.1, annex II to its first NDC.

For the second and subsequent NDCs, the description of the NDC and the information on tracking of progress, including accounting of NDCs, must be consistent with the guidance contained in decision 4/CMA.1 and its annexes. Further, Parties must clearly indicate how their reporting is consistent with decision 4/CMA.1.

A Party must provide any definitions needed to understand its NDC, including definitions of indicators selected to track progress of implementation or achievement of the NDC; any sectors or

categories defined differently than in the national inventory report; and mitigation co-benefits of adaptation actions and/or economic diversification plans.

The information on accounting shall also include, as applicable and available to an NDC:

1. Key parameters, assumptions, definitions, data sources and models used;

2. The IPCC guidelines used;

3. The metrics used;

4. Where applicable to its NDC, any sector, category or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, taking into account any relevant decision under the Convention, including as applicable:

a) The approach used to address emissions and subsequent removals from natural disturbances on managed lands;

b) The approach used to account for emissions and removals from harvested wood products;

c) The approach used to address the effects of age–class structure in forests;

5. Methodologies used to estimate mitigation co-benefits of adaptation actions and/or economic diversification plans;

6. Methodologies associated with any cooperative approaches that involve the use of internationally transferred mitigation outcomes towards the NDC, consistent with CMA guidance related to Article 6;

7. Methodologies used to track progress arising from the implementation of policies and measures;

8. Any other methodologies related to the NDC;

9. Any conditions and assumptions relevant to the achievement of the NDC.

In addition, each Party shall also:

1. For each indicator identified, describe how it is related to its NDC;

2. Explain how the methodology in each reporting year is consistent with the methodology(ies) used when communicating the NDC;

3. Explain methodological inconsistencies with its most recent national inventory report, if applicable;

4. Describe how double counting of net GHG emission reductions has been avoided, including in accordance with guidance developed in relation to Article 6, if relevant.

Structured summary

All the information referred to above (including information related to the chosen indicator(s)) shall be presented in a "structured summary" to track progress made in implementing and achieving the NDC.

The structured summary synthesizes the Party's reported information in a uniform and consistent manner, which assists external stakeholders, including other Parties and the international community, in viewing each Party's progress towards meeting its NDC targets.

The MPGs define the content of the structured summary. Note that in addition to the specific reporting requirements for the structured summary set out in paragraph 77(a)-(d), the structured summary must also provide the information stipulated by paragraphs 65–76, such as indicators, definitions, methodologies and accounting approaches.

The figure below presents information included in the structured summary, with reference to relevant paragraphs of the MPGs and relevant CTF tables.

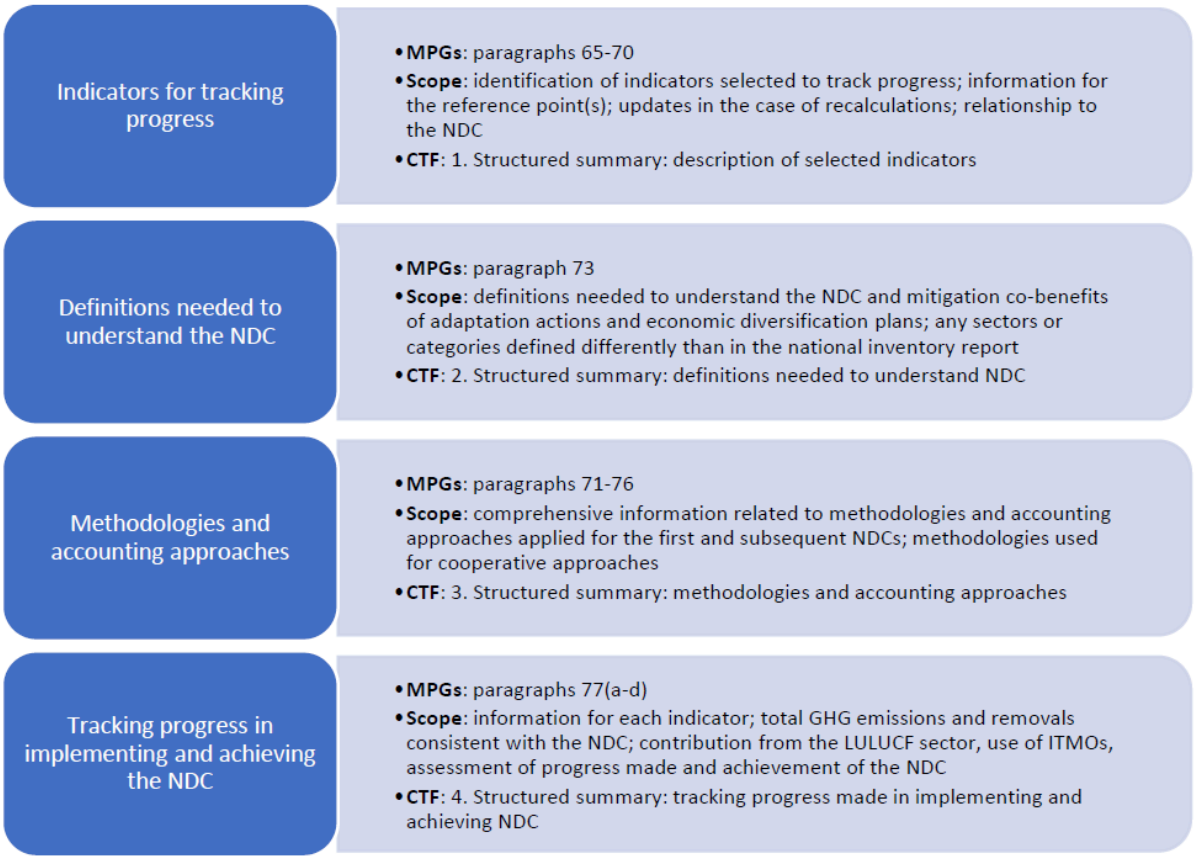

Figure 8. Information to be reported in the structured summary

The structured summary is made of 4 CTF tables:

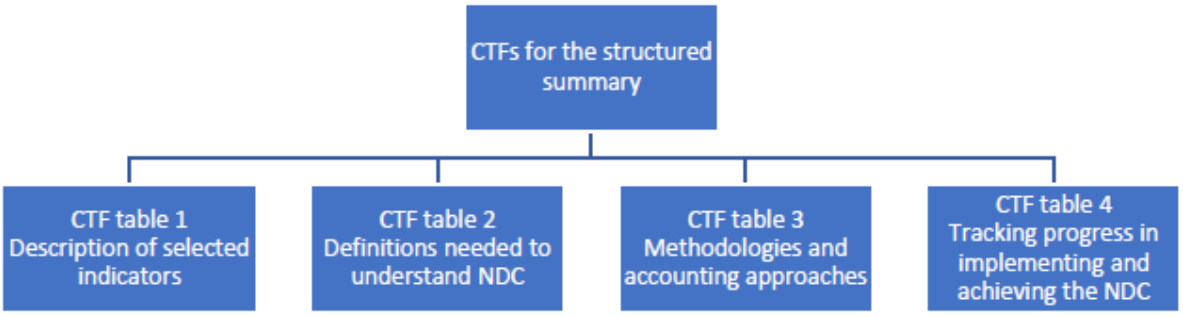

Figure 9. CTF tables for the structured summary

The first three common tabular formats address background information which is necessary to transparently track progress in the implementation and achievement of NDCs.

First, **CTF 1** allows for listing one or more indicators which are selected by the Party to track its progress in implementing and achieving its NDC. As a typical example, such an indicator could be the total emissions and removals of greenhouse gases within the boundaries of the country. The information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s) could be the total emissions and removals in the base year, e.g. in 1990.

1. Description of selected indicators

Indicator(s) selected to track progress	Description
{Indicator}	
Information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate	
Updates in accordance with any recalculation of the GHG inventory, as appropriate	
Relation to NDC	

Figure 10. CTF table 1 Description of selected indicators

Next, **CTF 2** provides space for definitions needed to understand each indicator, and other definitions needed to understand the NDCs.

2. Definitions needed to understand the NDC

	Description
Definition needed to understand each indicator:	
{indicator}	
Any sector or category defined differently than in the NIR:	
{Sector}	
{Category}	
Definition needed to understand mitigation co-benefits of adaptation actions and/or economic diversification plans:	
{Mitigation co-benefit(s)}	
Any other relevant definitions:	
{...}	

Figure 11. CTF table 2 Definitions needed to understand NDC

Finally, **CTF 3** addresses information on the accounting approach. This information is consistent with the accounting guidance (Annex II to decision 4/CMA.1)17 which was adopted in Katowice. Such information may include lengthy text and it may be more practical to provide it in the BTR, instead of using the table. Therefore, CTF 3 allows for entering references to the relevant section(s) of the BTR.

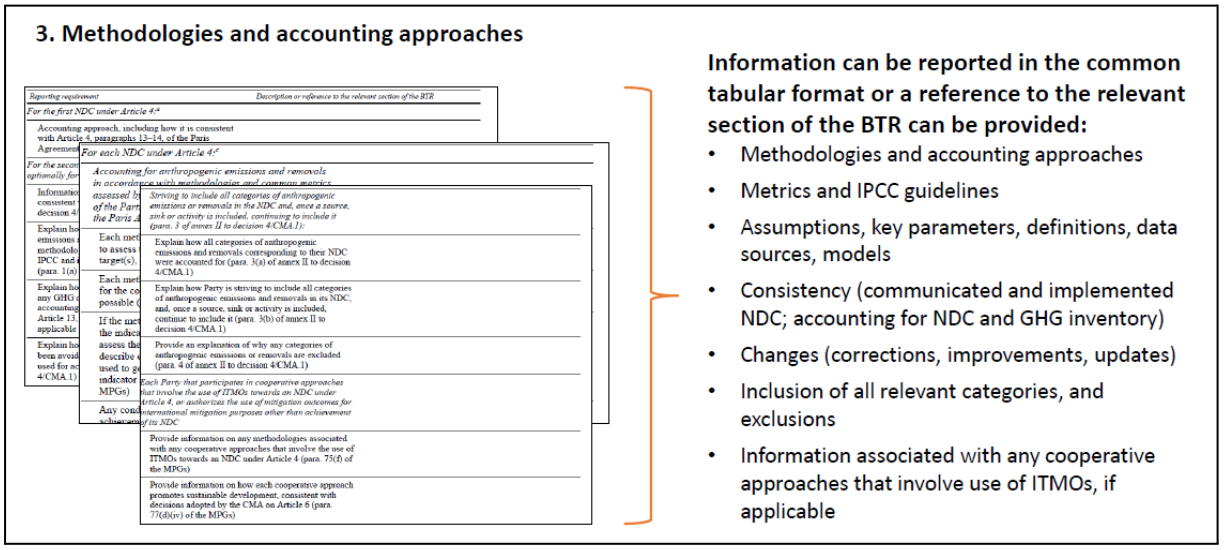

Figure 12. CTF table 3 Methodologies and accounting approaches

CTF 4 is the core of the structured summary - it allows for comparing the target or targets of the NDC to the progress made so far, by using selected indicators. While all Parties have to enter information on indicators, on greenhouse gas emissions (as applicable) and on achievement, a large part of this CTF is relevant only for Parties that use cooperative approaches. Specifically, this part is relevant for Parties that

- participate in cooperative approaches that involve the use of internationally transferred mitigation outcomes (ITMOs) towards an NDC (this would be the participation in voluntary cooperation under Article 6 of the Paris Agreement), or
- authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of the NDC (this would be, for example, the use of credits under the Carbon Offsetting and Reduction Scheme for International Aviation - CORSIA).

Parties that make use of ITMOs to achieve their NDC target, as well as Parties that authorize the use of ITMOs, have to adjust their emissions (or other indicators) according to specific rules, in order to ensure that emission reductions are not double counted.

4. Tracking progress

	Unit	Reference level	Implementation period of the NDC Year 1 Year 2 ... ... End year	Target level	Target year	Progress made (comparison of most recent and ref. level)
{Indicators}						
Total GHGs, consistent with NDC coverage	➡ *Where the goal is an economy-wide emission reduction target, data from GHG inventory* ➡ *Where the goal covers a subset of the economy, data will be a subset of the GHG inventory*					
Contribution from LULUCF sector, as applicable	➡ *May not be applicable to all NDC goal types if the NDC does not cover the LULUCF sector*					
ITMOs	➡ *May not be applicable, if ITMOs will not be considered towards the NDC goal*					
Assessment of the achievement of the NDC: → Restatement of the target → Information for reference level → Final information for the indicator at the target year → Comparison → Achievement of NDC (Y/N, explanation)	➡ *To be reported in the first BTR that contains information on the end year of NDC*					

Figure 13. CTF table 4 Tracking progress in implementing and achieving the NDC

Parties that have both a conditional and an unconditional target could proceed as follows:

- Duplicate the table.
- In one version of the table, enter the unconditional target level (e.g. 80 Mt CO_2e) in column "Target level".
- In the other version of the table, enter the conditional target level (e.g. 70 Mt CO_2e) in the column "Target level".
- In the documentation box below the table, specify which target is the conditional target and which target is the unconditional target.

Steps for tracking of progress made in implementing NDCs

According to the MPGs, to track progress in **implementing its NDC**, each Party shall in its BTR compare the most recent information for each selected indicator with the information for the reference points, levels, baselines, base years or starting points.

For the first biennial transparency report that contains information on the end year or end of the period of the NDC, each Party shall provide an assessment of whether it has **achieved the targets for its NDC**.

Assessing Party's progress in implementing its NDC is based on five steps thus constitute the NDC accounting approach as defined by the MPGs. If a NDC includes several targets, these steps should be applied to each target.

General approach for tracking Party's progress in implementing its NDC:

1. Countries define a relevant indicator for each target included in the NDC to track progress made in the implementation and achievement of the NDC (paragraph 65).
2. Second, countries provide the value of the indicator for a reference point, level, baseline, base year or starting point. For NDCs expressed as mitigation policies and measures, actions or plans, provide a summary of their status based on the selected qualitative (e.g. status (planned, adopted, implemented)) or quantitative (e.g. X per cent share of renewables owing to the implementation of the selected policy or measure) indicators (paragraph 67).
3. Further, countries must provide a full time series for each indicator from the base year until the most recent reporting year of the indicators, along with information on contribution of LULUCF and use of ITMOs, as applicable, and value of the indicators that correspond to the target year or period for each indicator (paragraph 68)
4. Compare the value of the indicators for the most recent year available with the reference point and note the relative (percentage) and absolute (in kt CO2 eq) difference (e.g. X.X per cent or X,XXXX.XX kt CO_2eq below the base year); in case of the qualitative indicator compare its status to the reference point if available (e.g. Policy A is still in the adoption phase while it was supposed to be implemented) (paragraph 69).;
5. Assess, on the basis of (1) to (4) above, whether the Party is making progress or not making sufficient progress towards its NDC targets;

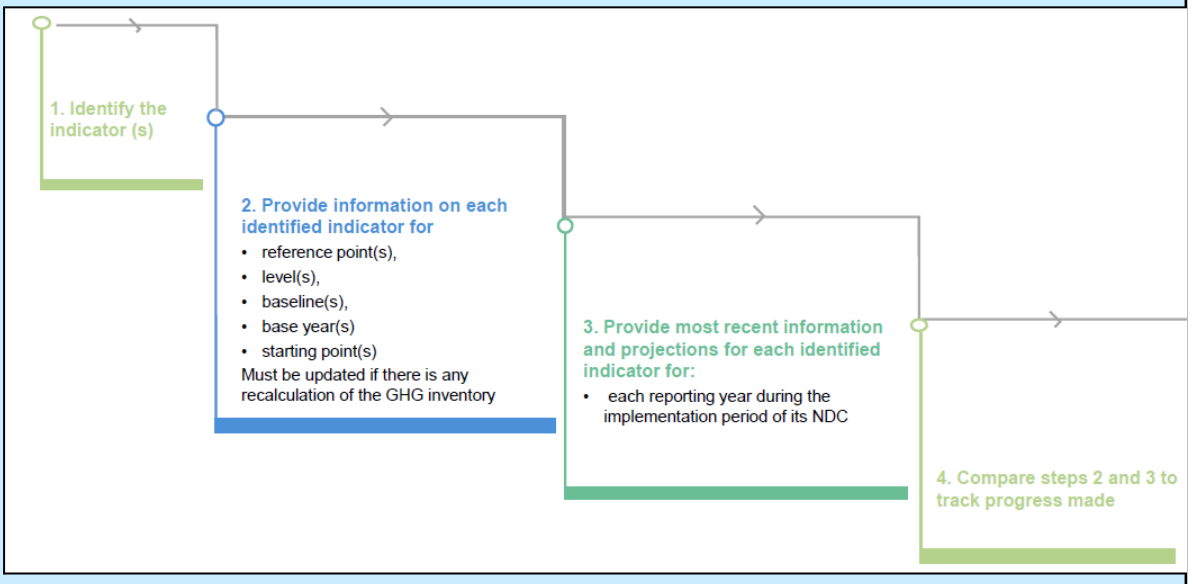

Figure 14. General approach for Parties to track progress made in implementing nationally determined contributions using indicators

For the last year of the NDC's implementation period, each country must additionally provide an assessment of whether it has achieved the target(s) for its NDC (paragraph 70).

❖ Step 1: Identification of indicator(s).

Countries shall identify an indicator for each target included in their NDC. The indicator applied shall be relevant to the target. This means that for quantitative targets the indicator must also be quantitative. The indicator should also be in the same metric as the target.

Most relevant indicator can be identified from the target itself if the target is SMART (Specific; Measurable; Ambitious; Relevant; Time-bound).

For example, if a target is expressed as a GHG emissions target, the indicator should be the GHG emissions covered by the NDC, reported in the same GWP metric.

As illustrated in table below, different types of indicators can be used, on the basis of the NDC target types.

Table 17: Potential indicators to keep track of progress in implementing and achieving NDCs with different types of NDC targets.

Type of mitigation target	Relevant indicators	Unit
GHG-related targets		
Absolute emission reduction or limitation target relative to a base year	GHG emissions • as reported in the national GHG inventory adapted to the specific scope of the target (e.g., gases and sectors covered), • including use of market-based mechanisms, and • adapted to the specific timeframe of the target (e.g., where a multi-year target-period applies).	kt CO_2 eq
Emission reduction target below a BAU level	Relationship (e.g., difference in %) between • GHG emissions in the BAU target year/ period (updated, where applicable) and • GHG emissions as reported in the national GHG inventory adapted to the specific scope of the target (e.g., gases and sectors covered), including use of market-based mechanisms, and adapted to the specific timeframe of the target (e.g., where a multi-year target-period applies)	%
Peaking Target	GHG emissions in all years leading to the current year, • as reported in the national GHG inventory adapted to the specific scope of the target (e.g., gases and sectors covered), • including use of market-based mechanisms	kt CO_2 eq
Intensity target	• GHG emissions - as reported in the national GHG inventory adapted to the specific scope of the target (e.g., gases and sectors covered), - including use of market-based mechanisms, and - adapted to the specific timeframe of the target (e.g., where a multi-year target-period applies) • divided by the relevant factor the target relates to, i.e., GDP, population, energy consumption, etc.	kt CO_2 eq / capita / GDP / etc. % (if compared to BAU or base period)

It is important to emphasize that Parties can include more than one target in their NDCs (for an example, see box below) and in such cases, it is expected that they will select different indicators for each of their targets.

NDC targets: China

- China's NDC includes the following targets:
  - to have CO_2 emissions peak before 2030 and achieve carbon neutrality before 2060;
  - to lower CO_2 emissions per unit of GDP by over 65 per cent from the 2005 level;
  - increase the share of non-fossil fuels in primary energy consumption to around 25 percent;

- to increase the forest stock volume by 6 billion m3 from the 2005 level;
- and to bring total installed capacity of wind and solar power to over 1.2 billion kW by 2030.

- China's NDC is available at the NDC Registry.
- There is no definition in the MPGs on what an indicator is, except that it should be self-determined by Parties, must be relevant for the NDC, and may be qualitative or quantitative.

Furthermore, it is important to note that under the BTR review process, TERTs will not review the adequacy or appropriateness of the indicators selected by Parties to track progress in implementing and achieving their NDCs.

What is an indicator?

- There is no definition in the MPGs on what an indicator is, except that it should be self-determined by Parties, must be relevant for the NDC, and may be qualitative or quantitative.
- Although there is no agreed definition in the MPGs as to what an indicator is, there are several examples in the relevant literature of how an indicator could be defined. For example:
  - The European Environment Agency defines an indicator as "a measure, generally quantitative, that can be used to illustrate and communicate complex phenomena simply, including trends and progress over time". For more information, visit https://www.eea.europa.eu/ims.
  - The Organization for Economic Co-operation and Development defines the (environmental) indicator as "a parameter, or a value derived from parameters, that points to, provides information about and/or describes the state of the environment, and has a significance extending beyond that directly associated with any given parametric value". For more information, visit https://www.oecd.org/environment/environment-at-a-glance/

Understanding which indicators are relevant

To be able to determine relevant indicators to track progress of the NDC, it is important to understand the nature of the NDC.

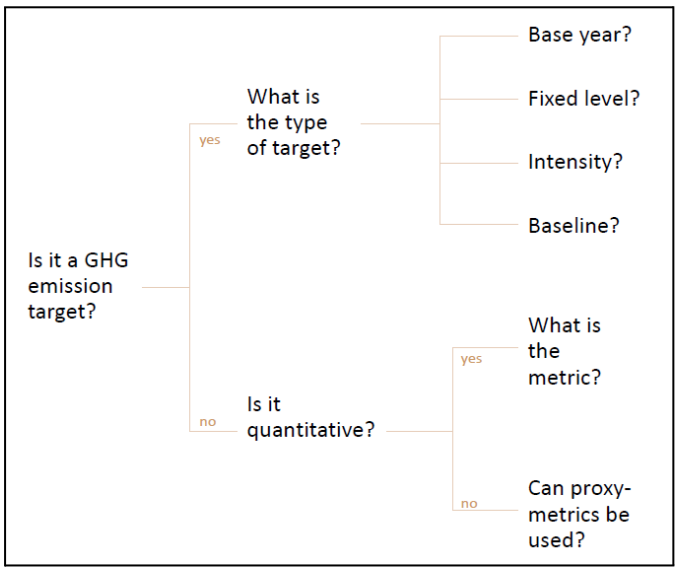

Figure 15. Logic to define relevant indicators

For a base year GHG emissions target as it is the case of Nigeria NDC 3.0 global target, the indicator should thus be the GHG emissions covered by the NDC in the relevant reporting year, expressed in t CO_2e. It is hereinafter referred to as ***Emissions***:

> ***Emissions:*** GHG emissions covered by the NDC in the relevant reporting year (t CO_2e)

In determining the emissions covered by the NDC, countries must take into account which greenhouse gases, sectors, categories, and activities and carbon pools in the LULUCF sector are included in the NDC.

If the GHG emissions target is economy-wide, the total GHG emissions as reported in the national GHG inventory must be used. Where the GHG emission target is not economy-wide, the relevant emission categories and gases from the national GHG inventory must be added together to determine the GHG emissions covered by the NDC.

This ensures consistency between the national GHG inventory, and the indicator used to track progress towards the NDC target.

❖ Step 2: Provision of the reference value(s) for the indicator(s).

Countries shall provide the respective value(s) of the indicator(s) for the relevant reference point(s), level(s), baseline(s), base year(s) or starting point(s).

What is the reference value of the indicator?

- In the case of base year targets: the reference value is the value of the indicator in the base year or period
- In the case of baseline scenario targets: the reference value is the projected BAU value in the target year or period

For example, if an NDC target is a GHG emission reduction compared to 2005, the GHG emissions as covered by the NDC target should be provided for 2005.

For a base year GHG emission target, the reference value for the indicator is the value of the GHG emissions covered by the NDC in the base year or period, hereinafter referred to as ***RefEmissions***.

‘

Table 18: Filled-in example CTF1 table on description of selected indicators

Indicator(s) selected to track progress	Description
Net GHG emissions and removals in CO_2eq	
Information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate	The reference level in the base year (1990) is 12,345 kt CO_2eq.
Updates in accordance with any recalculation of the GHG inventory, as appropriate	The reference level has been recalculated from 12,321 kt CO2eq in the previous national inventory to 12,345 kt CO_2eq in the national inventory which is submitted together with this BTR.
Relation to NDC	The indicator is defined in the same metric and unit as the target of the NDC.
Total area of forest in hectares	
Information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate	The reference level in the base year (2020) is 123,456 hectares.
Updates in accordance with any recalculation of the GHG inventory, as appropriate	No updates have been made.
Relation to NDC	The indicator is defined in the same metric and unit as the forestry-related target of the NDC.
Reduction of GHG emissions compared to the business-as-usual scenario	
Information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate	The baseline corresponds to total net GHG emissions and removals in a business-as-usual scenario. The baseline value in the base year (2020) is 12,345 kt CO_2eq. The baseline value in the target year (2030) is 16,789 kt CO_2eq. Baseline values for all years from 2020 to 2030 are provided in chapter 2 of the BTR
Updates in accordance with any recalculation of the GHG inventory, as appropriate	The baseline value in 2020 has been recalculated from 12321 kt CO_2eq to 12,345 kt CO_2eq. The baseline value in 2030 has been recalculated from 16,890 kt CO_2eq to 16,789 kt CO_2eq.
Relation to NDC	The percentage reduction (as communicated in the NDC) is determined by comparing total net GHG emissions from the GHG inventory (in kt CO_2eq) to the baseline level (in kt CO_2eq).

Table 24: Filled-in example CTF2 table on definitions needed to understand each indicator

Definitions[a]	
Definition needed to understand each indicator:	Indicator 'Net GHG emissions and removals': Net GHG emissions and removals correspond to the annual totals reported in CO_2 equivalents in the latest national GHG inventory. The totals comprise all sectors and gases listed in the CTF table entitled 'Reporting format for the description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates'.
	Indicator 'Total area of forest in hectares': Area with woody vegetation consistent with the thresholds used to define Forest Land in the national inventory document.
	Indicator 'Reduction of GHG emissions compared to the business-as-usual scenario': The reduction of GHG emissions in percent is determined by comparing total net GHG emissions from the GHG inventory (in kt CO_2eq) to the baseline level (in kt CO_2eq).
Any sector or category defined differently than in the national inventory report:	{Sector} Not applicable
	{Category} Not applicable
Definition needed to understand mitigation co- benefits of adaptation actions and/or economic diversification plans:	{Mitigation co-benefit(s)} Not applicable
Any other relevant definitions:	{...} Not applicable

❖ Step 3: Provision of a time series of the indicator value(s)

Countries must provide the most recent indicator value(s) as well as the value(s) for previous years of the NDC implementation period (paragraph 67 and 77(a)(ii)). This means that countries must provide a time series of indicator values. The most recent indicator values(s) must be compared to the reference value(s) (paragraph 67).

In providing time series information, it is important that methodological consistency is ensured. This means that the same methods and a consistent approach should be used for each reported year (see section II.C, paragraphs 26-28, of the MPGs for GHG inventories). Countries are encouraged to improve their emissions and other data over time, moving towards more accurate methods. In practice, national GHG inventories are often recalculated due to such methodological improvements. If new methods are applied, it is important to recalculate the entire time series of the emissions or other relevant data. This is to ensure methodological consistency and to avoid that changes in emission trends (or GDP or population data) are introduced as a result of changes in methods or assumptions across the time series (see section II.C, paragraph 27, of the MPGs for GHG inventories). Any changes in the methods and recalculations must also be applied to the reference value in the base year target or period (paragraph 67).

For base year GHG emission targets, countries should provide a full time series of GHG emissions covered by the NDC (***Emissions***) from the base year or period until the most recent reporting year. Such a time series should also be provided for all other relevant parameters.

	Unit, as applicable	Reference point(s) […]	2021	2022	…	2030	Target level	Target year or period	Progress made […]
Indicator(s) selected […]									
GHG emissions covered by the NDC	Mt CO_2e	100 *RefEmissions*	88	86			80 *TargEmissions*	2030	
Where applicable, total GHG emissions and removals consistent with the coverage of the NDC	Mt CO_2e	100	88	86					
Contribution from LULUCF […]									
Each Party that participates in cooperative approaches […]									
[…]	Relevant for Parties using cooperative approaches. See *Table 9*								
Assessment of the achievement of the Party's NDC under Article 4 of the Paris Agreement									
Relate the target of the Party's NDC:									
[…]	Relevant after the end of the NDC period. See *Table 10*								

Figure 16. Example of a time series of GHG emissions covered by the NDC filled in CTF table 4 for a base year GHG emission target

❖ Step 4: Comparison of the most recent indicator value with the reference value

Countries must provide for each reporting year within the NDC implementation period the most recent information for each indicator (paragraph 68) and compare it to the reference value (paragraph 69).

When comparing the most recent indicator with the reference value, countries could determine the absolute and/or the relative change of the respective values.

For base year GHG emission targets, the absolute change in GHG emissions can be determined as follows:

$$AbsCompEmissions = Emissions - RefEmissions$$

Where:

- ***AbsCompEmissions***: Absolute change in GHG emissions covered by the NDC in the relevant reporting year compared to base year or period (t CO_2e).
- ***Emissions***: GHG emissions covered by the NDC in the relevant reporting year (t CO_2e).

The relative change in GHG emissions can be determined as follows:

$$RelCompEmissions = (Emissions / RefEmissions - 1) * 100$$

Where:

- ***RelCompEmissions***: Relative change in GHG emissions covered by the NDC in the relevant reporting year compared to base year or period (%).

Figure below shows a simplified example of a filled in CTF4 table in a Party BTR3 submission, reporting for the period 2025-2026. The Party's NDC target is a 30 per cent reduction in emissions below the base year (2005) level by 2030 (target year). The implementation period is from 2021 to 2030. The Party will not account for the contribution from the LULUCF sector and is not participating in cooperative approaches.

	Unit	Reference point (base year)	Implementation period of the NDC	2025	2026	Target level	Target year or period	Progress made by comparing the information for indicator with the base year
Indicator(s) selected to track progress and supporting information:								
Total GHG emissions without LULUCF	kt CO_2 eq	1,000	....	1,100	1,150	700	2030	In 2026, total GHG emissions without LULUCF is 15 per cent [above] base year emissions
Where applicable, total GHG emissions and removals consistent with the NDC	kt CO_2 eq	NA	....	1,100	1,150			
Contribution from the LULUCF sector, as applicable	NA	NA	NA	NA	NA			
Information on ITMOs, if applicable	NA	NA	NA	NA	NA			

NA = not applicable

Figure 17. Example of a filled in CTF4 table in a Party BTR3 submission

❖ Step 5: Assess whether the Party is making progress or not making sufficient progress towards its NDC targets

Figure below shows a simplified example of the trend of a quantitative indicator used in tracking progress of an NDC, that is, total GHG emissions, and three key points necessary to assess the progress: reference point (GHG emissions in the base year), GHG emissions for the most recent year available and the level of emissions that corresponds to the emission reduction target (calculated as a per cent reduction of base-year emissions because the NDC target in this hypothetical case is a base-year emission reduction target). For simplicity, it is assumed that the Party will not account for the contribution from the LULUCF sector and will not use ITMOs.

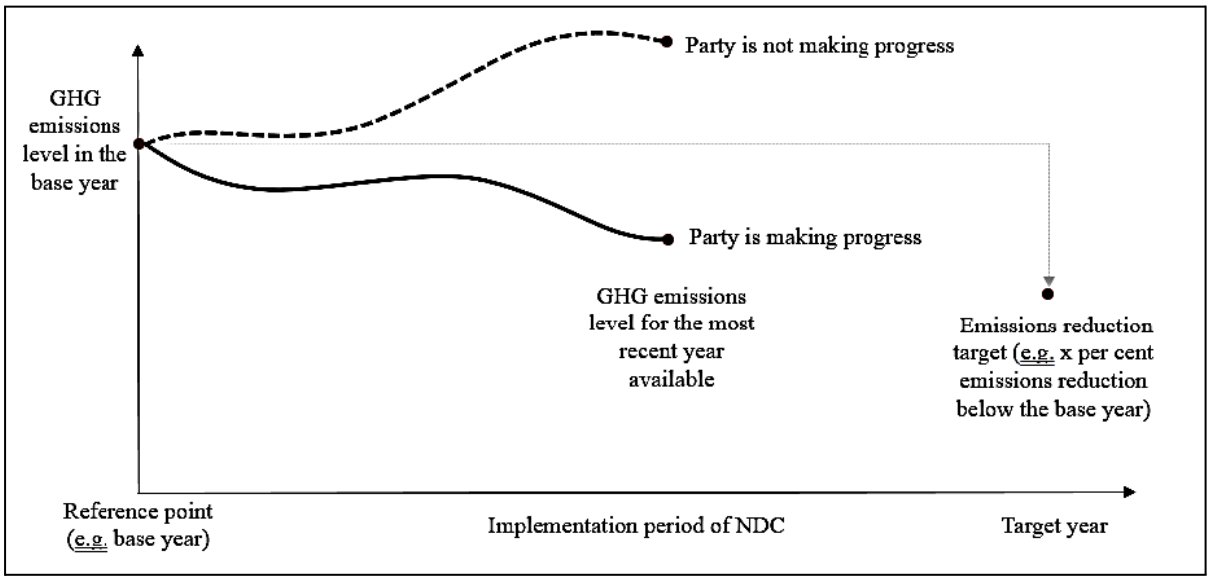

Figure 18. Example of tracking progress in the implementation period of an NDC

In considering the progress, the value of the indicator for the most recent year available is compared with the reference point findings in terms of the relative (percentage) and absolute (in kt CO2 eq) difference are noted. If the value of the indicator for the most recent year is constantly below the reference point (base-year emissions) and the trend is more or less consistent with this relative position, it means that Party is progressing towards the NDC target.

Conversely, if the value of the indicator for the most recent year is constantly above the reference point (dashed line) and the trend is more or less consistent with this relative position, it means that the Party is diverging from the NDC target and could face challenges in achieving it.

b. Data requirements and sources:

- **Data:** GHG emission data at national level and for LULUCF sector.
- **Sources:** The National GHG Inventory

c. Annual data collection and validation process:

- GHG data: Collected annually by the inventory team from sectoral agencies, compiled into the NID.
- Other indicators (if selected): Collected by relevant line ministries based on their mandates.

- All data is submitted to the NCCC or designated MRV unit for compilation, validation, and integration into the BTR.

d. Data quality assurance and control procedures:

- Application of IPCC quality control/quality assurance (QC/QA) procedures for the GHG inventory.
- Cross-verification of activity data with independent sources (e.g., utility data for energy, satellite imagery for land use).
- Technical peer review of the compiled BTR data and assessment.

e. Data flow diagram:

[Sectoral ministries/data sources] -> [Raw data] -> [NCCC/MRV unit for compilation & QC] -> [Populate CTF tables 1,2,3,4] -> [Integration into BTR structured summary] -> [Technical review & finalization]

f. International best practices:

- Selecting a limited set of SMART (Specific, Measurable, Achievable, Relevant, Time-bound) indicators that directly relate to the NDC target.
- Ensuring methodological consistency in the time series and recalculating entire time series if methods are improved.
- Providing a clear "structured summary" using the CTF tables to synthesize all tracking information

g. Template for data submission and review:

The official Common tabular formats (CTF 1, 2, 3 and 4) provided in the ETF reporting guidance serve as the mandatory templates. Internal data collection sheets should be designed to feed directly into these CTFs.

7.2 Tracking ITMOs

This sub-chapter provides operational guidance for compiling and reporting information related to Internationally Transferred Mitigation Outcomes (ITMOs) and their role in achieving Nigeria's NDC 3.0, in line with the Enhanced Transparency Framework of the Paris Agreement.

In a nutshell

Countries that wish to engage in Article 6 need to fulfil several additional requirements in relation to accounting for their NDC. These include four broad elements that are summarized in more detail below:

- Fulfilling Article 6 participation requirements.
- The authorization of ITMOs.
- The tracking of ITMOs; and
- The reporting and accounting for ITMOs.

As regards Article 6 reporting and NDC accounting, the Article 6 guidance and the MPGs require countries to regularly report on their ITMO activities and to account for ITMOs through the application of corresponding adjustments in an accounting balance, referred to as "structured summary" in the MPGs (paragraph 77 of the MPGs). Countries engaging in Article 6 need to provide relevant information in an initial report, annual reports, and biennial transparency reports. This requires relevant institutional arrangements and processes for regular reporting to be in place. Non-submission of relevant reports, in particular on the application of corresponding adjustments, can pose serious threat to ensuring that double claiming is avoided. The following type of accounting information needs to be provided:

- In an initial report, communicated "no later than authorization of ITMOs from a cooperative approach or where practical (in the view of the participating Party), in conjunction with the next Biennial Transparency Report", countries need to communicate inter alia their accounting choices, as set out above (paragraph 18 of the draft Article 6.2 guidance). The term "first transfer" refers to the first time that a specific ITMO is transferred; subsequently, an acquired ITMO could be further transferred to another country.
- In annual reports, countries need to provide information on "authorization of ITMOs for use towards achievement of NDCs, authorization of ITMOs for use towards other international mitigation purposes, first transfer, transfer, acquisition, holdings,

cancellation, voluntary cancellation, voluntary cancellation of mitigation outcomes or ITMOs towards overall mitigation in global emissions and use towards NDCs" (paragraph 20 of the Article 6.2 guidance).

- In their BTRs, countries need to provide comprehensive information on their engagement in cooperative approaches. For accounting purposes, a key requirement is the reporting on the application of corresponding adjustments. For each year, countries need to make additions and subtractions to their net emissions and removals covered by the NDC. The resulting balance is then compared with the target emissions level (necessarily in t CO2e) (paragraph 70 of the MPGs).

1. Reporting provision: Paragraphs 59-63 - National circumstances and institutional arrangements

- **Format:** Narrative
- **Related CTF:** Not applicable

a. Approach:

Under this reporting provision, Nigeria must describe its institutional and regulatory framework for participating in cooperative approaches under Article 6. The narrative should explain:

- **Legal and institutional arrangements (Para 61-62):** Identify the authority responsible for authorizing ITMOs (e.g., the National Council on Climate Change - NCCC). Describe the legal basis, administrative procedures, and institutional roles for approving and tracking Article 6 activities. This includes how Nigeria ensures robust accounting to avoid double counting.
- **National circumstances (Para 59-60):** Briefly explain how Nigeria's national context (e.g., its need for international investment to meet its ambitious conditional target) informs its strategic intention to use cooperative approaches.

b. Data requirements and sources:

- **Data:** Legal texts, governmental decrees, administrative procedures, and organizational mandates related to Article 6.
- **Sources:** The Climate change act, NCCC mandates, operational guidelines for international carbon markets, and inter-ministerial agreements.

c. Annual data collection and validation process:

Information is compiled by the NCCC or designated national authority for Article 6. It is a descriptive process, updated as institutional arrangements evolve, and validated through legal review and inter-agency consultations.

d. Data quality assurance and control procedures:

- Cross-referencing with official government gazettes and legal documents.
- Validation by the legal department of the relevant ministry (e.g., Federal Ministry of Justice, NCCC).

e. Data flow diagram

[NCCC & legal bodies] -> [Draft arrative on institutional setup] -> [Inter-ministerial review] -> [Final BTR chapter]

f. International best practices

- Clearly designating a national authority for Article 6 activities.
- Publishing clear and transparent procedures for project approval and authorization.

g. Examples from other countries

- **Switzerland** and **Japan** have established detailed operational frameworks and have published clear guidance for their private sectors on engaging in Article 6.
- **Ghana** has been proactive in developing institutional structures for its carbon market involvement.

h. **Template for data submission and review**

A standard document template with sections for describing the authorizing body, legal basis, and procedural steps for ITMO authorization.

2. Reporting provision: Paragraph 64 - Description of a party's NDC

- **Format:** Narrative and common tabular format (Voluntary)
- **Related CTF:** Appendix: Description of a Party's NDC

a. **Approach**

Under this reporting provision, Nigeria must clearly state its intention regarding the use of ITMOs. In the voluntary table for NDC description, the specific row on "Intention to use cooperative approaches..." must be populated based on Nigeria's official position as stated in its NDC 3.0. If Nigeria decides to use ITMOs, this must be explicitly stated here. Any updates to this intention (e.g., a decision to participate in a specific mechanism) must be reported as a clarification.

b. **Data requirements and sources**

- **Data:** The official position on the use of ITMOs.
- **Sources:** The NDC 3.0 document and any subsequent government decisions on Article 6 participation.

c. **Annual data collection and validation process**

This is a policy-level decision. The data is sourced directly from the NDC document and official government statements. It is verified by the NCCC for accuracy in reporting.

d. **Data quality assurance and control procedures**

- Direct extraction from the official, submitted NDC 3.0 document.
- Confirmation with the national Article 6 authority to ensure the reported intention is still current.

e. **Data flow diagram**

[NDC 3.0 document & policy decisions] -> [Extraction into NDC description table] -> [NCCC verification] -> [Inclusion in BTR]

f. International best practices

- Providing a clear and unambiguous statement on the intention to use ITMOs.
- If applicable, specifying the types of cooperative approaches (e.g., Article 6.2 or 6.4) Nigeria intends to use.

g. Examples from other countries

- **Singapore** has explicitly stated its intention to use international carbon credits to achieve its NDC.
- **Japan** has clearly outlined its strategy for utilizing Article 6 in its NDC implementation.

h. Template for data submission and review

The predefined "Appendix: Description of a Party's NDC" from Annex II of the transparency guidance is the template.

3. Reporting provision: Paragraphs 65-79 - Information necessary to track progress (with ITMOs)

- **Format:** Narrative and common tabular format
- **Related CTF:** CTF Tables 1, 2, 3, and 4

a. Approach

This is the core of ITMO tracking. The process involves integrating ITMO transactions into the standard progress tracking, primarily through **CTF Table 4**. The MPGs require a "corresponding adjustment" to a Party's emissions balance to avoid double counting when ITMOs are used.

Key steps for ITMO reporting:

1. **Indicator and methodology definition (CTF Tables 1 & 3):**
    - The primary indicator remains **"GHG emissions covered by the NDC"** for tracking the progress made in implementing Nigeria NDC 3.0.
    - **CTF Table 3** must describe the **accounting methodology for ITMOs**, including how corresponding adjustments are applied (e.g., the metrics and rules used).


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2. **Provision of a time series with ITMO data (CTF Table 4):** Report a full time series of:
    - The indicator (GHG emissions).
    - An **indicative emissions trajectory or budget** for the NDC period (highly recommended for Parties using ITMOs).
    - Key ITMO transaction data for each year:
        - **Annual quantity of ITMOs first transferred.**
        - **Annual quantity of ITMOs acquired.**
        - **Annual quantity of ITMOs used towards the NDC.**
        - **Net annual quantity of ITMOs** (Acquired - Transferred).
        - **Total quantitative corresponding adjustments** applied.
3. **Application of corresponding adjustments and assessment (CTF Table 4):**
    - Calculate the **annual adjusted indicator**: This is the indicator (GHG emissions) + Net ITMOs (Acquired - Transferred).
    - **Track Progress:** Compare the **annual adjusted indicator** against the target or indicative trajectory. Progress is assessed based on this adjusted balance, ensuring that the use of ITMOs is transparently reflected.

b. Data requirements and sources

- **Data:**
    - GHG inventory data (from NID).
    - Data on all ITMO transactions (first transfers, acquisitions, authorizations) from the previous years.
    - The predefined emissions trajectory/budget.
- **Sources:**
    - National GHG Inventory.
    - The national registry system used to track ITMOs.
    - Reports from project proponents and international transaction logs.

c. Annual data collection and validation process

- The GHG inventory team provides emissions data.
- The national Article 6 authority/registry administrator compiles all ITMO transaction data from the reporting year.
- The NCCC/MRV unit consolidates this data, applies the corresponding adjustments, and populates CTF Tables 1, 3, and 4.

d. Data quality assurance and control procedures

- Robust registry management with secure data handling to prevent double counting or errors.
- Reconciliation of transaction data between the Nigerian registry and the host country registries (partner countries).
- Independent audit of the ITMO data and accounting procedures.
- Technical review of the completed CTF tables to ensure mathematical consistency in the application of adjustments.

e. Data flow diagram

[GHG inventory team] -> [Emissions data] [Article 6 registry] -> [ITMO transaction data] -> [NCCC/MRV unit for consolidation & accounting] -> [Populate CTF 1, 3, and 4 with adjusted indicator] -> [Technical review & finalization of BTR]

f. International best practices

- Establishing and maintaining a robust, transparent national registry that is interoperable with other systems.
- Using a pre-defined emissions trajectory or budget to assess compliance when using ITMOs, rather than just a single-year target.
- Providing clear, timely annual reports on ITMO activities as required by Article 6 guidance.
- Engaging in capacity-building to ensure the national authority can manage the complex accounting requirements.

g. Examples from other countries

- **Switzerland** and **Sweden** have provided examples in their reports (and in the guidance document) showing how they populate CTF Table 4 with ITMO data, corresponding adjustments, and the resulting adjusted emissions balance.
- **Ghana** and **Thailand** are developing robust institutional and registry systems to participate in Article 6.2 and 6.4 mechanisms.

h. Template for data submission and review

The official common tabular formats (CTF 1, 2, 3, and 4) are the mandatory templates. The national Article 6 authority should develop internal data collection sheets that mirror the fields required in **CTF table 4** to streamline the reporting process.

Example of a completed CTF4 table for a country participating in cooperative approaches

- A Party has selected the option of providing an emissions trajectory to account for ITMOs and engages in ITMOs expressed in greenhouse gas metrics. The Party defined a trajectory, starting with 89 Mt CO2e in 2021 and decreasing linearly down to 80 Mt CO2e in 2030. This trajectory will be taken into account for assessing compliance at the end of the NDC implementation period; it is not sufficient to just achieve the target value in the year 2030.
- Annual quantity of ITMOs first transferred: ITMOs amounting to 2 Mt CO2e are first transferred in 2021 and in 2022.

	Unit, as applicable	Reference point(s) [...]	2021	2022	...	2030	Target level	Target year or period	Progress made [...]
Indicator(s) selected [...]									
GHG emissions covered by the NDC	Mt CO_2e	100 *RefEmissions*	88	86		*TargEmissions*	80	2021 to 2030	14% below the reference level
Where applicable, total GHG emissions and removals consistent with the coverage of the NDC	Mt CO_2e	100	88	86					
Contribution from LULUCF [...]									
Each Party that participates in cooperative approaches [...]									
[...] indicative trajectory, trajectories or budget [...]									
[...] trajectory, trajectories or budget [...]	Mt CO_2e		89	88		80			
[...] emissions/ removals (non-GHG metrics)									
[...] emissions/ removals (PaMs NDC)									
[...] non-GHG indicator									
Annual quantity of ITMOs first transferred	Mt CO_2e		2	2					
Annual quantity of mitigation outcomes authorized	Mt CO_2e		1	1					
Annual quantity of ITMOs used towards achievement of the NDC									
Net annual quantity of ITMOs	Mt CO_2e		2	2					
[...] cumulative amount of ITMOs [...]									
Total quantitative corresponding adjustments used [...]	Mt CO_2e		2	2					
[...] cumulative information									
[...] annual emissions balance	Mt CO_2e		90	88					
[...] annual adjusted indicator									
Any other information									

Figure 19: Example of a completed CTF4 table for a country participating in cooperative approaches

7.3 Filling CTF related to information necessary to track progress on the implementation and achievement of the domestic policies and measures implemented to address the social and economic consequences of response measures

In a nutshell

Nigeria, as an economy significantly reliant on fossil fuels, may implement policies to manage the social and economic impacts of the global low-carbon transition (e.g., just transition programs for oil-producing communities, economic diversification plans). If such policies form part of the NDC or are reported voluntarily, CTF12 is used to describe them, their objectives, and progress in implementation.

Based on an analysis of NDCs submitted to the UNFCCC, the Parties that have NDCs that consists of economic diversification plans resulting in mitigation co-benefits; or NDCs that consists of adaptation actions resulting in mitigation co-benefits are predominantly developing countries, and often those with significant vulnerability to climate change or economies highly dependent on a single sector (like fossil fuels or agriculture).

It is noted in this context that:

- Economic Diversification NDCs are most common among fossil-fuel-dependent economies (especially in the Middle East, North Africa, and some parts of the CIS).
- Adaptation-Focused NDCs are most common among the most vulnerable nations, particularly LDCs and SIDS, where climate impacts are a direct threat to development and survival.

These Parties are the ones for whom filling out **CTF12** in their Biennial Transparency Reports is either mandatory (if their NDC is exclusively of this type) or highly relevant (if it is a significant component of a mixed NDC).

a. Approach

The implementation of mitigation measures (also known as 'response measures') has particular consequences in countries whose economies are centred on fossil fuels. These countries have to address the social and economic consequences resulting from a shift away from fossil fuels, e.g. by diversifying their economy and by supporting a just transition of their workforce.

When the MPGs were negotiated in Katowice, it was important for several Parties to be given a space for the reporting on domestic policies and measures to address the social and economic

consequences of response measures. This space was provided in the chapter on tracking of progress, in paragraph 78 of the MPGs. In line with this paragraph, a common tabular format - CTF 12 - was included in the transparency guidance.

CTF 12 is to be filled in by Parties that have one of two types of NDCs:

- NDCs that consists of economic diversification plans resulting in mitigation co-benefits; or
- NDCs that consists of adaptation actions resulting in mitigation co-benefits.

- **Parties with NDCs that consist of economic diversification plans resulting in mitigation co-benefits.**

This category typically includes countries whose economies are heavily reliant on the extraction and export of fossil fuels (oil, gas, coal). Their NDCs focus on diversifying their economies into sectors like tourism, manufacturing, renewable energy, or technology, which naturally leads to lower GHG emissions compared to a fossil-fuel-dependent "Business-as-Usual" scenario.

Key examples:

✔ **Saudi Arabia:** Its NDC is explicitly framed around the "Saudi Green Initiative" and "Middle East Green Initiative," which are core components of its broader Vision 2030 economic diversification strategy. The mitigation outcomes are co-benefits of moving away from an oil-dependent economy.

✔ **United Arab Emirates (UAE):** Similarly, the UAE's NDC is closely linked to its economic diversification vision. Its investments in nuclear power (Barakah plant), solar energy (e.g., Mohammed bin Rashid Al Maktoum Solar Park), and a knowledge-based economy are central to its climate actions.

✔ **Azerbaijan:** As an oil and gas-producing nation, Azerbaijan's NDC emphasizes "green growth" and economic diversification as a primary strategy, with mitigation presented as a co-benefit.

✔ **Oman & Qatar:** These Gulf states also frame their climate actions within the context of long-term economic diversification plans away from hydrocarbon revenues.

- **Parties with NDCs that consist of adaptation actions resulting in mitigation co-benefits.**

This category is common among **Least Developed Countries (LDCs)** and **Small Island Developing States (SIDS)**, for whom adaptation to climate impacts is the overwhelming priority. Their NDCs often focus on climate-resilient practices that also happen to sequester carbon or reduce emissions.

Key examples:

- ✔ **Bhutan:** A classic example. Bhutan's development philosophy of gross national happiness and its constitutional mandate to remain carbon neutral is deeply integrated with forest conservation (a major adaptation and resilience action). Its vast forest cover, which protects against landslides and regulates water, is its primary carbon sink. Its NDC is essentially a plan to maintain this adaptive forest cover, with mitigation as a co-benefit.
- ✔ **Ethiopia:** Ethiopia's NDC is centered on its Climate-Resilient Green Economy (CRGE) strategy. Many of its key actions, like "Protecting and re-establishing forests for their economic and ecosystem services," are fundamentally about adaptation (reducing land degradation, securing water supplies) with massive mitigation co-benefits through carbon sequestration.
- ✔ **Nepal:** Nepal's NDC focuses heavily on adaptation in sectors like forestry, water resources, and agriculture. Its plans for community-based forest management and agroforestry are primarily for enhancing resilience and livelihoods, with the reduction of emissions/deforestation and increased removals being a co-benefit.
- ✔ **Many Pacific Island States (e.g., Fiji, Vanuatu, Solomon Islands):** For these nations, adaptation (e.g., protecting coastal zones, ensuring water security, building resilient food systems) is existential. Their NDCs prioritize these actions. For instance, restoring mangrove forests is primarily for coastal defense (adaptation) but also sequesters carbon (mitigation co-benefit).
- ✔ **Cambodia:** Cambodia's NDC includes significant actions on promoting climate-resilient agriculture and sustainable forest management, which are adaptation-focused but deliver mitigation outcomes.

- **Parties with a mixed approach**

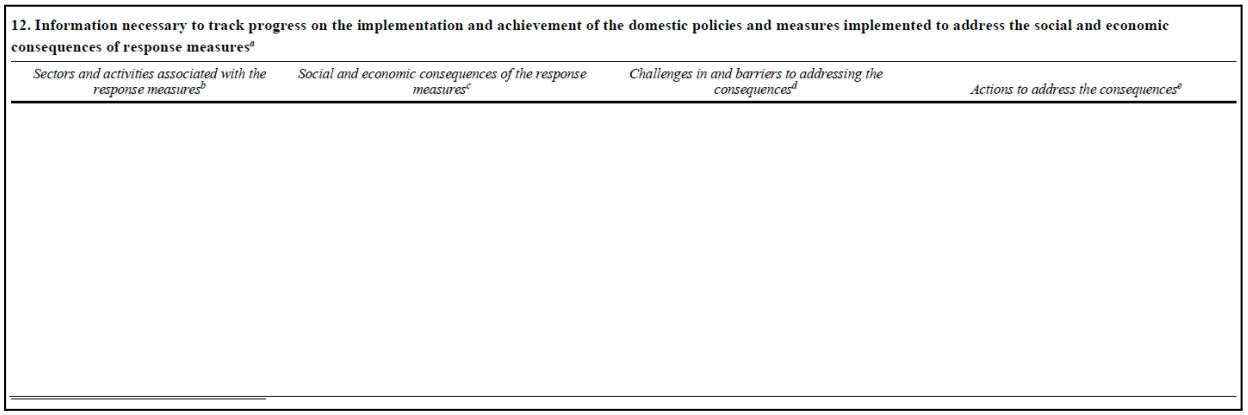
It is important to note that many countries have a **mixed NDC**, which includes **both** clear emission reduction targets **and** elements of economic diversification or adaptation with mitigation co-benefits.

- **Chile:** Has an absolute emission target but also emphasizes a "just socio-ecological transition" and green hydrogen production for economic diversification.

- **Rwanda:** Has a mitigation target but its NDC is fully integrated with its national adaptation strategy.
- **Kenya:** Has significant mitigation contributions but frames them within its "Low Carbon Climate Resilient Development Pathway."

For Parties with an NDC that consists of economic diversification plans, it is rather straightforward to fill in CTF 12 because economic diversification is a typical example of a policy that addresses the social and economic consequences of response measures. However, it may be difficult for Parties with a NDC that consists of adaptation actions to provide the requested information, because they may not have policies or measures in place to address the social and economic consequences of response measures.

Parties with other types of NDCs (e.g. those with emissions reduction targets) are not required to provide the information requested in CTF 12.



12. Information necessary to track progress on the implementation and achievement of the domestic policies and measures implemented to address the social and economic consequences of response measures[a]

Sectors and activities associated with the response measures[b]	*Social and economic consequences of the response measures[c]*	*Challenges in and barriers to addressing the consequences[d]*	*Actions to address the consequences[e]*

Figure 20. CTF12 - Information necessary to track progress on the implementation and achievement of the domestic policies and measures implemented to address the social and economic consequences of response measures

b. Data requirements and sources

- **Data**: Descriptions of policies, their objectives, implementing entities, timelines, and status.
- **Sources:** National development plans, just transition strategies, and reports from relevant ministries (e.g., Ministry of Niger Delta Affairs, Ministry of Finance, Budget and national planning,…).

c. Annual data collection and validation process

Information is compiled by the ministries responsible for the listed policies and submitted to the NCCC for inclusion in the BTR.

d. Data quality assurance and control procedures

- Verification against official policy documents and government work plans.
- Inter-ministerial review to ensure accurate representation.

e. Data flow diagram

[Relevant ministry] -> [Policy information] -> [NCCC for compilation into CTF12] -> [Inclusion in BTR]

f. International best practices

- Clearly linking the reported policies to the goal of mitigating the adverse effects of climate response measures.
- Providing concrete examples of initiatives and their outcomes for affected communities.

g. Examples from other countries

Based on analysis of NDCs 2.0 and BTR 1 submitted to the UNFCCC, no filled CTF 12 table has been found for countries with NDCs that consists of economic diversification plans resulting in mitigation co-benefits; or countries with NDCs that consists of adaptation actions resulting in mitigation co-benefits nor for countries which have a mixed NDC, which includes both clear emission reduction targets and elements of economic diversification or adaptation with mitigation co-benefits.

h. Template for data submission and review

The official CTF12 table is the required template.

Sectors and activities associated with the response measures[b]	*Social and economic consequences of the response measures*[c]	*Challenges in and barriers to addressing the consequences*[d]	*Actions to address the consequences*[e]

7.4 Filling CTFs related to tracking progress made in implementing Nigeria mitigation policies and measures, actions and plans

Paragraph(s) of the MPGs	Heading	Format of reporting	Related CTF
Paragraphs 80-90	D. Mitigation PaMs, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving an NDC under Article 4 of the Paris Agreement	Information to be reported in a narrative and common tabular format	CTF table 5

This sub-chapter provides operational guidance for compiling and reporting information on the actions, policies, and measures that Nigeria is implementing to achieve its NDC 3.0. The guidance is structured around the completion of **CTF table 5**, which is the primary tool for this reporting under the Enhanced Transparency Framework.

In a nutshell

The approach for reporting information on actions, policies, and measures that Nigeria is implementing to achieve its NDC 3.0 is centered on systematic data collection and presentation in a standardized table (CTF table 5). Reporting is not limited to entirely new policies; it includes ongoing, planned, and updated policies that have the most significant impact on GHG emissions or affect key categories in Nigeria's national GHG inventory.

The process involves:

1. **Identification & prioritization:** Identifying all relevant PaMs from Nigeria's NDC 3.0 and other national climate strategies (e.g., the Energy Transition Plan, National Climate Change

Policy,…). Priority should be given to those with the most significant expected impact on emissions.

2. **Structured reporting in CTF table 5:** For each PaM, populating the mandatory fields as per Paragraph 82 of the MPGs. This provides a clear, comparable snapshot of Nigeria's mitigation actions.

3. **Reporting on co-benefits (Paragraph 84):** Specifically identifying and reporting on policies that yield **mitigation co-benefits resulting from adaptation actions** (e.g., climate-smart agriculture, sustainable forestry,…) and **economic diversification plans** (e.g., investments in renewable energy to reduce oil dependence,…). These are a core part of Nigeria's NDC and must be clearly flagged in the reporting.

4. **Quantitative estimation:** For key policies and measures, developing and reporting estimates of expected and achieved GHG emission reductions, as stipulated by Paragraph 85. The methodologies and assumptions used for these estimates must be described, which can be done in an annex to the Biennial Transparency Report.

5. **Tracking evolution:** For subsequent BTRs, identifying policies that are no longer in place and explaining why, as well as updating the status of policies (e.g., from "planned" to "adopted").

a. Approach:

Article 3 of the Paris Agreement requires Parties to undertake ambitious efforts as part of their NDCs towards achieving the purpose of the Agreement.

Parties are required to pursue domestic mitigation measures (Article 4, paragraph 2) and provide information necessary to track progress in implementing and achieving NDCs (Article 13, paragraph 7).

Definitions

- **Mitigation policies or mitigation plans** generally refer to a decision or a set of decisions that a government takes to achieve certain objectives.

- **Actions or measures** generally refer to a concrete activity or set of activities taken by a government to implement a policy or plan.
- **Mitigation co-benefits** result from actions undertaken as part of adaptation and/or economic diversification plans where these generate emissions reductions and thereby contribute to achieving mitigation outcomes.

It should be noted that the CGE uses the term '**mitigation measures**' in its training material (source []) in a broad sense, to cover:

- Strategies & strategic documents.
- Policies & legal frameworks.
- Programmes, projects & activities.

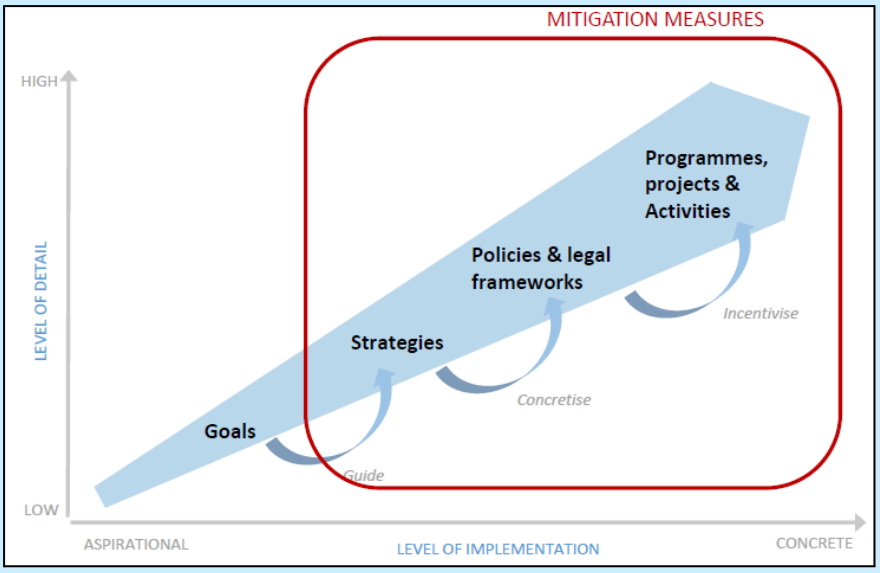


Figure 21: Graph showing mitigation measures

Table 20: Examples of mitigation policies and measures, actions and plans being implemented around the world, as reported by Parties

Country	Mitigation policies and measures, actions and plans
Australia	Australia has extended and deepened its support for clean technology through the launch of its Technology Investment Roadmap, which will help to drive further investment in low-emission technologies, including clean hydrogen,

	electricity storage, low-emission steel and aluminium production, carbon dioxide capture and storage, and carbon sequestration.
Canada	Canada is investing in public transport and making zero emission vehicles more affordable and accessible, for instance through rebates and funding for more charging stations.
France	France has implemented a carbon tax with an energy excise fee, an energy savings certificate system, and investment schemes for the development of infrastructure and alternative fuels.
Japan	Japan promotes compliance with energy-saving standards for new buildings and energy-saving renovation of existing homes and promotes investment in net zero energy buildings. It is also working towards the realization of a 'hydrogen society'.
New Zealand	New Zealand has reformed its national Emissions Trading Scheme to support the country in meeting its NDCs and domestic emission reduction targets. The reforms include introducing an emissions cap in line with climate change targets, phasing out emission allocation to the industrial sector from 2021 and introducing an auction by the Government of New Zealand Units (emission units).
Norway	Norway has committed to achieving a 50-55 per cent reduction in emissions by 2030 and a climate-neutral, low-emission society by 2050. Norway plans to achieve these goals through various measures, including participation in the European Union Emissions Trading System, application of green taxes and provision of support for energy-efficient and climate-friendly technologies, including carbon capture and storage.
Botswana	Botswana is addressing emission reductions in the energy sector by increasing the share of renewable energy sources, including by investing in solar power stations, solar appliances and biogas development.
The Republic of Korea	The Republic of Korea launched a national emissions trading system in 2015, covering 525 companies in its first phase (2015-2017). Through this system, the country plans to promote low-carbon industry innovation and green investment,

	reduce GHGs in a cost-effective and flexible way and achieve national emission reduction targets.
Lebanon	Lebanon is working to increase the share of renewable energy sources as part of its energy mix, aiming to increase the share of renewables to 18 per cent of overall power demand and 11 per cent of heat demand by 2030. These efforts will be complemented by energy efficiency measures.
Maldives	Maldives is working to reduce emissions from the waste sector through a combination of improved waste management across the islands and the introduction of a new waste-to-energy project.

As part of tracking progress made in the implementation and achievement of its NDC, countries shall report necessary information on 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 an NDC.

Paragraph 80: Each Party shall provide information on actions, policies and measures that support the implementation and achievement of its NDC under Article 4 of the Paris Agreement, focusing on those that have the most significant impact on GHG emissions or removals and those impacting key categories in the national GHG inventory. This information shall be presented in narrative and tabular format.

- Parties do not need to report every action, policy or measure that impacts GHG emissions or removals. Parties should focus on those that have the most significant impact on emissions or removals. It is recommended that Party describe how it has determined which actions, policies and measures to include in its BTR.
- A key category is one that is prioritized within the national GHG inventory system because its estimate has a significant influence on a country's total inventory of GHGs in terms of the absolute level, the trend, or the uncertainty associated with emissions and removals. Whenever the term key category is used, it includes both source and sink categories.

Paragraph 81: To the extent possible, Parties shall organize the reporting of actions by sector (energy, transport, industrial processes and product use, agriculture, LULUCF, waste management and other).

- According to the guidance provided in note (i) to CTF table 5, the reporting of information on actions by sector must be organized, to the extent possible, using the given sectors.
- Where a Party does not use the given sectors, it should provide an explanation for not doing so, as well as an indication of how its definition of sectors corresponds to or differs from the suggested sectors.
- Note that, as indicated in decision 18/CMA.1, annex, paragraph 82(f), Parties may indicate that a measure affects a single sector or multiple sectors.

Paragraph 82: Each Party shall provide the following information on its actions, policies and measures, to the extent possible, in a tabular format:

a) Name

- The information reported must include the name of the policy, measure, action or plan.
- The Party may indicate whether a policy, measure, action or plan is included in the 'with measures' scenario.

b) Description

- The description of the policy, measure, action or plan can be brief.
- Additional information may be provided on the cost of the mitigation action, the non-GHG mitigation benefits of the action or how the mitigation action interacts with other mitigation actions, as appropriate.
- The Party should identify those actions, policies and measures that influence GHG emissions from international transport.
- The Party should, to the extent possible, provide information about how actions, policies and measures are modifying longer-term trends in GHG emissions and removals.

c) Objectives

- The information reported must include the key objectives and benefits of the policy, measure, action or plan.

d) Type of instrument (regulatory, economic instrument or other)

- The information reported must include, to the extent possible, whether the measure is a regulation, an economic instrument or another type of instrument.
- Examples of possible other types of instruments include fiscal, voluntary (e.g. agreements), informational, educational and research measures.

e) Status (planned, adopted or implemented)

- The information reported must include, to the extent possible, whether the policy, measure, action or plan is in the planning stage, adopted or implemented.
- Parties may also provide information related to the status of implementation, for example, funds already allocated

f) Sector(s) affected (energy, transport, industrial processes and product use, agriculture, LULUCF, waste management or other)

- The information reported must include, to the extent possible, which sector(s) is/are affected by the action, policy or measure.
- The following sectors must be used by Parties: energy, transport, IPPU, agriculture, LULUCF, waste management or other.

g) Gases affected

- The information reported must include, to the extent possible, which gas or gases the policy, measure, action or plan targets.

h) Start year of implementation

- The information reported must include, to the extent possible, in which year the policy, measure, action or plan was or is expected to be implemented.

i) Implementing entity or entities.

- The information reported must include, to the extent possible, the implementing entity or entities (e.g. national, state, provincial, regional or local government) and the involvement of any other entities (e.g. private sector organizations).

Paragraph 83: Each Party may also provide the following information for each action, policy and measure reported:

a) Costs

- Any action taken to mitigate climate change may divert financial resources from alternative uses. Mitigation assessments estimate the value of these resources using cost-benefit analysis. Incremental costs are normally measured relative to a 'no action' counterfactual baseline. As far as possible, assessments should include all costs, but bear in mind that technical options, including many energy efficiency measures, may have negative costs in terms of, for example, economic benefits.
- It may not make sense to specify a cost for non-technical, socially focused actions. Examples of this type of action include campaigns to encourage the public to waste less energy or efforts to develop less energy intensive urban environments. These actions are typically referred to as 'no regrets' actions.

b) Non-GHG mitigation benefits

- Any action taken to mitigate climate change may also generate non-GHG benefits. These can range from impacts on sustainable development to economic and social consequences of response measures to reduced emissions of other types of pollutants and/or health benefits.
- Parties can report using quantitative and/or qualitative indicators when describing non-GHG benefits.
- The information reported may be linked to the availability of reliable indicators or data that can be collected on a regular basis and at reasonable cost.

c) How the mitigation actions as identified in paragraph 80 above interact with each other, as appropriate

- Two or more actions taken to mitigate climate change may interact and could completement one another in ways that enhance overall GHG mitigation. Parties may report on the interaction between such policies.

Paragraph 84: For each Party with an NDC under Article 4 of the Paris Agreement that consists of mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans consistent with Article 4, paragraph 7, information to be reported under paragraphs 80, 82 and 83 above includes relevant information on policies and measures contributing to mitigation co-benefits resulting from adaptation actions or economic diversification plans.

- Information on mitigation co-benefits resulting from Parties' adaptation actions or economic diversification plans must be reported in both narrative and tabular (CTF table 5) format, as applicable, in line with decision 5/CMA.3.
- Examples of adaptation actions or economic diversification plan measures that may result in mitigation co-benefits include the following:
  - Applying climate-smart agriculture;
  - Reducing food waste;
  - Adapting coastal ecosystems;
  - Increasing the share of renewable energy sources in energy generation;
  - Improving energy efficiency;
  - Implementing carbon dioxide capture and storage;
  - Switching fuels and implementing fuel price reforms;
  - Transitioning to a more circular economy;
  - Adopting sustainable tourism practices;
  - Deploying technologies for the fisheries, industrial and buildings sectors.

Paragraph 85: Each Party shall provide, to the extent possible, estimates of expected and achieved GHG emission reductions for its actions, policies and measures in the tabular format referred to in paragraph 82 above; those developing country Parties that need flexibility in the light of their capacities with respect to this provision are instead encouraged to report this information.

- Parties may report this information for individual mitigation actions, policies and measures, or for groups thereof.
- Developing country Parties that need flexibility in the light of their capacities are encouraged rather than required to report this information.

REFERENCE IN THE MPGS (ANNEX TO DECISION 18/CMA.1)	PROVISION IN THE MPGS	FLEXIBILITY PROVISION FOR THOSE DEVELOPING COUNTRY PARTIES THAT NEED IT IN THE LIGHT OF THEIR CAPACITIES
Paragraph 85 *Expected and achieved GHG emission reductions for PAMs*	Each Party shall provide, to the extent possible, estimates of expected and achieved GHG emission reductions of its PAMs	Instead encouraged to report such information

Figure 22. Flexibility provisions relating to estimates of GHG emission reductions

- This information should indicate the estimated emission reduction in CO_2eq for a particular year - and not the cumulative impact.

- CTF table 5 indicates that Parties must provide estimates of GHG emission reductions in kt CO_2eq and distinguish between estimates for reductions achieved and reductions expected.

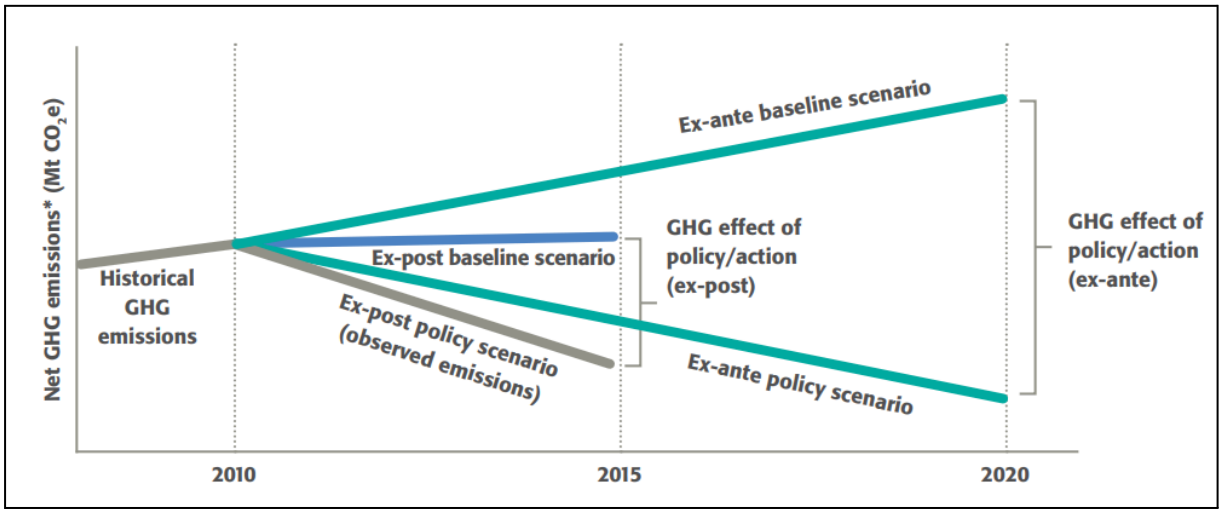


Figure 23. Assessment of the GHG emission reductions expected (ex-ante) and achieved (ex-post)

Paragraph 86: Each Party shall describe the methodologies and assumptions used to estimate the GHG emission reductions or removals due to each action, policy and measure, to the extent available. This information may be presented in an annex to its biennial transparency report.

- The information reported should explain how Parties have arrived at the values reported in CTF table 5 for estimates of expected and achieved GHG emission reductions for the years reported.
- In addition to information on the specific methodologies used for calculating the estimates of expected and achieved GHG emission reductions or removals, Parties could report on any key underlying assumptions, for example for GDP growth, population growth, tax level and international fuel price.
- Information on methodologies and assumptions may be presented in an annex to the BTR.

Paragraph 87: Each Party should identify those actions, policies and measures that are no longer in place compared with the most recent biennial transparency report and explain why they are no longer in place.

- For the first BTR, a comparison with previous BTRs will not be possible. Some Parties may voluntarily compare their actions, policies and measures with their previous biennial report or biennial update report, but this is not required.

Paragraph 88: Each Party should identify its actions, policies and measures that influence GHG emissions from international transport.

- Parties are encouraged to provide information on measures taken to influence emissions from international transport. This information should be reported in CTF table 5, in the "Description" column.
- The 2006 IPCC Guidelines for National Greenhouse Gas Inventories (vol. 1, section 8.3) and the MPGs both indicate that emissions from international aviation and maritime transport (also known as international bunker fuel emissions) should be calculated as part of the national GHG inventories of Parties - but should be excluded from national totals and reported separately, if disaggregated information is available.
- Examples of policies and measures that influence GHG emissions from international transport include:
    - Participating in global market-based measures, such as CORSIA (Carbon Offsetting Reduction Scheme for International Aviation);
    - Implementing incentives to support the development of sustainable aviation fuels;
    - Improving aviation and marine technologies, including developing electric or hybrid electric aircraft and energy-efficient ships;
    - Building the capacity to develop systems for monitoring, reporting and verifying emissions in international transport;
    - Preparing national action plans to reduce emissions from international shipping.

Paragraph 89: Each Party should, to the extent possible, provide information about how its actions, policies and measures are modifying longer-term trends in GHG emissions and removals.

- This information is to be provided to the extent possible; some Parties may not have the capacity to provide it.
- Parties may choose to fulfil this requirement in various ways, including by indicating the mitigation impact of their actions, policies and measures over time or by providing information on their national circumstances, climate strategy and planned actions.

- Parties may also choose to provide qualitative information on how actions, policies and measures are modifying longer-term trends. This information could include, for example, relevant elements of a long-term emission reduction strategy or sustainable development strategy. This information could be included in the "Description" column of CTF table 5.

Paragraph 90: Each Party is encouraged to provide detailed information, to the extent possible, on the assessment of economic and social impacts of response measures.

- Response measures in the context of the UNFCCC are the actions, policies, programmes and other measures undertaken by Parties mostly for mitigating GHG emissions. In addition to their direct mitigation impact, implementation of these response measures can have social, environmental and economic consequences (both positive and negative) with impacts that could be either domestic or cross-border.
- Examples of social impacts include changes in gender equality, social relationships, health, education, status of different social groups (Indigenous peoples; ethnic minorities; lesbian, gay, bisexual, transgender and intersex persons; etc.) and access to rights. Economic impacts include changes in national or regional GDP, employment levels and income. Environmental impacts include changes in pollution levels and impacts on biodiversity.
- In assessing and analysing the impacts of response measures, both quantitative and qualitative methodological approaches can help.
- Examples of quantitative approaches include:
    - Computable general equilibrium models, which model whole economies using economic data;
    - Integrated assessment models, which integrate geophysical and economic data;
    - Macroeconometric models, which provide behavioural data.
- Examples of qualitative approaches include:
    - Stakeholder interaction analyses, which can provide insight into policy impacts and help to validate quantitative findings;
    - Expert assessments, which can assist in providing country-specific insights;
    - Qualitative surveys, which can help to close gaps in quantitative data.
- Noting that information on response measures is also required for tracking progress (as per decision 18/CMA.1, annex, para. 78), the information to be provided as per paragraph 90 is:

- Specific actions, policies or measures that are expected to have social and economic impacts;
- Specific Parties affected;
- Sectors and/or stakeholders affected;
- Methods of assessing impacts;
- The results of impact assessments.

- However, to fulfil the requirements of paragraph 90, Parties are encouraged to provide detailed information, to the extent possible, on the assessment of economic and social impacts of response measures.
- Examples of the information to be provided in relation to this requirement include
  - A description of international impact assessment methods;
  - A description of national impact assessment methods;
  - Examples of international financial support and/or collaboration.

b. Data requirements and sources

- **Data**: The data required corresponds directly to the columns of CTF Table 5:
  - Mandatory (Para 82): Name, Description, Objectives, Type of Instrument, Status, Sector(s) Affected, Gases Affected, Start Year of Implementation, Implementing Entity/Entities.
  - Encouraged (Para 83): Costs, Non-GHG Mitigation Benefits (e.g., job creation, improved air quality), Interaction with other PaMs.
  - For Co-benefits (Para 84): Explicitly tag PaMs as contributing to "mitigation co-benefits from adaptation" or "from economic diversification."
  - Quantitative (Para 85-86): Estimates of expected and achieved GHG emission reductions (in kt CO_2e).
- **Sources:**
  - NDC 3.0 Document: The primary source for listed policies and measures.
  - National Climate & Development Strategies: Nigeria's Energy Transition Plan (ETP), National Climate Change Policy and Response Strategy, National Adaptation Plan, and Long-Term Vision.
  - Line Ministries: Federal Ministry of Environment, Ministry of Power, Ministry of Agriculture and Rural Development, Ministry of Petroleum Resources, Ministry of Transport, etc.

- Project Documents: Feasibility studies, project design documents, and monitoring reports for specific initiatives.
- National Budgets and Appropriation Acts: For information on costs and funding.
- National development plans, just transition strategies, and reports from relevant ministries (e.g., Ministry of Niger Delta Affairs, Ministry of Finance, Budget and National Planning).

c. Annual data collection and validation process

1. Data call: The National Council on Climate Change or designated MRV unit issues a formal data call to all relevant line ministries and agencies, providing them with a pre-formatted template based on CTF Table 5.
2. Sectoral data submission: Each ministry populates the template for the PaMs under their purview, providing updates on status, implementation progress, and, where available, quantitative estimates of emission reductions.
3. Central compilation: The NCCC/MRV unit compiles all submissions into a master CTF Table 5.
4. Technical review & gap-filling: The unit reviews the compiled data for completeness, consistency, and clarity. It follows up with ministries to fill any data gaps and ensure alignment with NDC 3.0.
5. Validation workshop: A draft of the compiled PaMs report is presented at an inter-ministerial and stakeholder workshop for validation, discussion, and final approval.

d. Data quality assurance and control procedures

- Source verification: Cross-checking information from ministry submissions against official policy documents, legislation, and budget allocations.
- Standardized definitions: Ensuring all ministries use consistent definitions for "Status" (Planned/Adopted/Implemented), "Sector," and "Type of Instrument."
- Methodological consistency for quantification: For GHG estimates, using approved methodologies (e.g., from IPCC, CDM) and ensuring assumptions are clearly documented and applied consistently.
- Peer review: Having compiled CTF Table 5 and supporting methodologies reviewed by technical experts independent of the data collection process.

e. Data flow diagram

[Line ministries & agencies] -> [Completed PaM templates] -> [NCCC/MRV unit for compilation & review] -> [Draft CTF table 5 & narrative] -> [Inter-ministerial & stakeholder validation workshop] -> [Final CTF table 5 included in BTR] -> [Methodologies & assumptions documented in BTR annex]

f. International best practices

- Prioritization: Focusing reporting on the most impactful PaMs to provide a clear, high-level overview without being overwhelmed by detail.
- Clear quantification: Where capacity allows, moving from qualitative descriptions to quantitative estimates of GHG impacts, which greatly enhances transparency and allows for better tracking of progress towards the NDC target.
- Linking to inventory: Explicitly connecting reported PaMs to the trends seen in the National Greenhouse Gas Inventory, explaining how policies are influencing emissions in key sectors.
- Transparency on status: Being honest and clear about the implementation status of policies (e.g., distinguishing between "adopted" but not yet fully "implemented").
- Highlighting co-benefits: Effectively communicating the sustainable development and adaptation benefits of mitigation actions, as this is a key part of Nigeria's NDC narrative.

g. Examples from other countries

- European Union Member States: Routinely report detailed PaMs in their National Energy and Climate Plans (NECPs), including status, projected emissions savings, and costs, providing a robust model for structured reporting.
- Switzerland: Provides a highly detailed and systematic example of PaM reporting. In its Biennial first transparency report, Switzerland uses a standardized table to list its core policies and measures, such as its CO_2 levy, building renovation program, and emissions trading system. For each measure, Switzerland reports:
    - A precise legal reference and description.
    - The objective, often with a quantitative target (e.g., "reduce emissions from buildings by 40% by 2026 compared to 1990").
    - The type of instrument (e.g., "economic," "regulatory").
    - The status
    - The affected sectors and gases.
    - Quantitative estimates of achieved and expected emission reductions for each policy, along with a clear explanation of the methodologies used to calculate these estimates. This level of quantification is a best practice that Nigeria can aspire to as its MRV capacity develops.

- Kenya: Provides information on its progress in implementing renewable energy projects, often including data estimated emission reductions.

Table 21: Relevant section of BTRs from other countries

Country	Relevant section of the BTR	Pages
European Union	BTR : Please refer to section "3.4 Mitigation policies and measures" CTF 5	Page 44 to page 92
Switzerland	BTR : Please refer to section "II.D Mitigation policies and measures, actions and plans" CTF 5	Page 57 to page 107
Kenya	BTR : Please refer to section "2.4. 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" CTF 5	Page 22 to page 39

h. Template for data submission and review:

The information provided by a Party on its mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, will be reported in both narrative and tabular format, and both formats are subject to review:

- Information reported in narrative format
- Information reported using CTF (CTF table 5, annex II to decision 5/CMA.3 contains CTF tables)

The primary template is the official **CTF Table 5**. For internal data collection from ministries, Nigeria should develop a standardized spreadsheet that mirrors the structure of CTF Table 5, including the following columns:

- Reference ID (e.g., NDC-PaM-01)
- Name of Policy, Measure, or Action (Para 82a)
- Description (Para 82b) : Include here if it influences international transport (Para 88) or modifies long-term trends (Para 89)
- Objectives (Para 82c)
- Type of instrument (Regulatory, Economic, Other) (Para 82d)
- Status (Planned, Adopted, Implemented) (Para 82e)
- Sector(s) affected (Para 82f)
- Gases affected (Para 82g)
- Start year of implementation (Para 82h)
- Implementing entity/entities (Para 82i)
- Mitigation co-benefit category (Adaptation action / Economic diversification plan) (Para 84)
- Estimated GHG emission reductions (kt CO_2e) - for key years (Para 85)
- Non-GHG benefits (e.g., jobs, health, energy access) (Para 83b)
- Costs (if available) (Para 83a)
- Interactions with other PaMs (if significant) (Para 83c)

This internal template will ensure that all necessary data is collected in a format that can be directly transferred into the official CTF for submission in the BTR.

7.5 Filling CTFs related to the projection of GHG emissions

Table 22: Filling CTFs related to the projection of GHG emissions

Paragraph(s) of the MPGs	Heading	Format of reporting	Related CTF
Paragraphs 92-102	F. Projections of GHG emissions and removals, as applicable	Information to be reported in a narrative and common tabular format	• CTF table 7 Information on projections of greenhouse gas emissions and removals under a 'with measures' scenario; • CTF table 8 Information on projections of greenhouse gas emissions and removals under a

			'with additional measures' scenario; ● CTF table 9 Information on projections of greenhouse gas emissions and removals under a 'without measures' scenario; ● CTF table 10 Projections of key indicators ● CTF table 11 Key underlying assumptions and parameters used for projections

This sub-chapter provides operational guidance for developing and reporting projections of greenhouse gas emissions and removals.

In a nutshell

Projections provide an indicative picture of the future impact of Nigeria's mitigation policies and measures and are a mandatory part of the BTR under the Enhanced Transparency Framework. It is critical to note that unless a projection scenario is explicitly identified as the baseline for Nigeria's NDC, these projections are for informational purposes only and **shall not be used to assess progress** towards the NDC target. The core requirement is to report a **'With Measures' (WEM)** scenario.

The process involves:

1. **Define scenarios:** Develop at least two core scenarios:
    - **'With Measures' (WEM) Scenario (Mandatory):** This scenario includes the effects of all **implemented and adopted** climate policies and measures. This is the baseline projection that shows where Nigeria is headed with its current policy framework.
    - **'With Additional Measures' (WAM) Scenario (Encouraged):** This scenario adds the effects of **planned** policies and measures. This shows the additional impact if

Nigeria's full NDC ambition is realized and is highly recommended to illustrate the gap between current policy and NDC goals.

2. **Establish timeframe:** Projections must start from the most recent year in the National Inventory Report and extend **at least 15 years** beyond the next year ending in 0 or 5 (e.g., from 2023 to 2040). As a developing country, Nigeria can flexibly report projections **at least to the end point of its NDC (2030)**.
3. **Ensure coverage:** Projections must be developed for all sectors (Energy, IPPU, Agriculture, LULUCF, Waste) and for individual gases. Results must be presented **with and without the LULUCF sector** and use the same Global Warming Potential metric as the NID.
4. **Utilize CTF tables:** Report the quantitative projections using:
    - **CTF Table 7** for the WEM scenario.
    - **CTF Table 8** for the WAM scenario (if developed).
    - **CTF Table 10** for projections of key indicators relevant to the NDC (e.g., share of renewable energy, emissions intensity).
    - **CTF Table 11** for reporting the key parameters and assumptions used.

a. Approach:

Parties must report information on projections of GHG emissions and removals. Projections are meant to provide an indicative picture of the impact of mitigation policies and measures on the future trends of GHG emissions and removals and shall not be used to assess progress towards the implementation and achievement of a Party's NDC unless the Party has identified a reported projection as its baseline for its NDCs.

Projection scenarios

The MPGs in paragraph 94 define the three scenarios associated with projections of GHG emissions and removals:

- **A 'with measures' (WEM) projection scenario**: Encompasses currently [implemented] and [adopted] policies and measures

- **A 'with additional measures' (WAM) projection scenario**: Encompasses [implemented], [adopted] and [planned] policies and measures, and
- **A 'without measures' (WOM) projection scenario**: If provided, it excludes all policies and measures [implemented], [adopted] and [planned] after the year chosen **as the starting point for the projections**

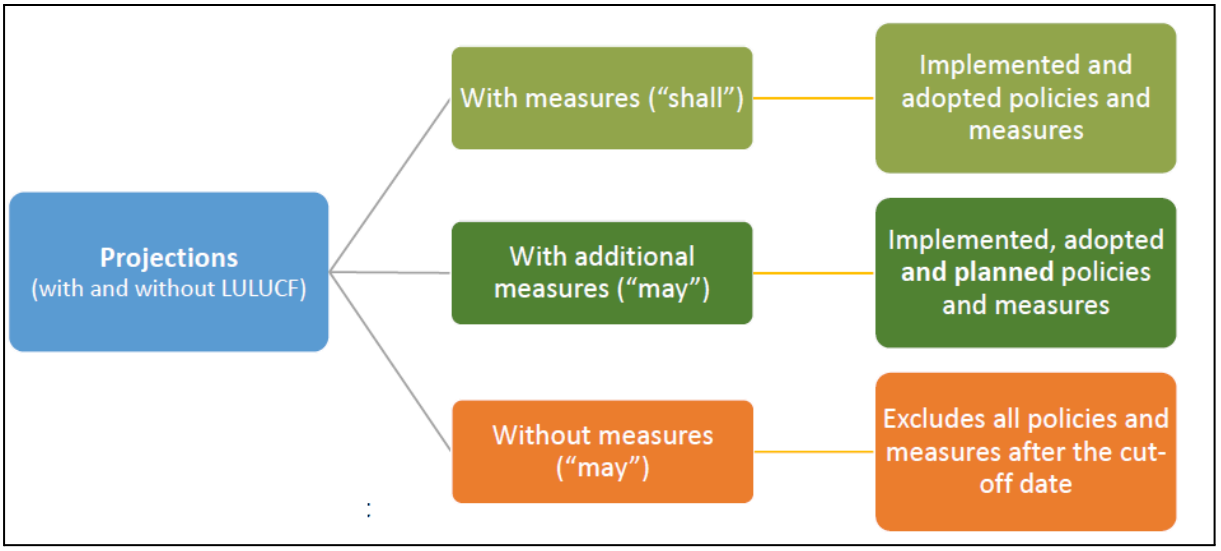


Figure 24: Scenarios associated with projections of GHG emissions

It needs to be clear which measures reported under MPG section III.D and in the CTF table 5 are included in which of the scenarios **'with measures and with additional measures'.** Not all measures may be included, as some may not be quantifiable. Estimated future impacts of individual measures may not add up to scenario results due to interactions between measures

Definitions

Although the difference between implemented, adopted, and planned polices and measures is not specifically described in the MPGs, based on the existing reporting practice under Convention (see decision 6/CP.25, paragraph 26) the following descriptions could be considered:

- **Implemented policies and measure** are those to which one or more of the following may apply: national legislation is in force; one or more voluntary agreements have been established; financial resources have been allocated; human resources have been mobilized.

- **Adopted** are those in relation to which an official government decision has been made and there is a clear commitment to proceed with implementation.
- **Planned** are those for which options are under discussion and have a realistic chance of being adopted and implemented in the future.

According to the MPGs, each Party shall report a 'with measures' scenario and may report the other scenarios; those developing countries that need flexibility in the light of their capacities are encouraged to report information on projections.

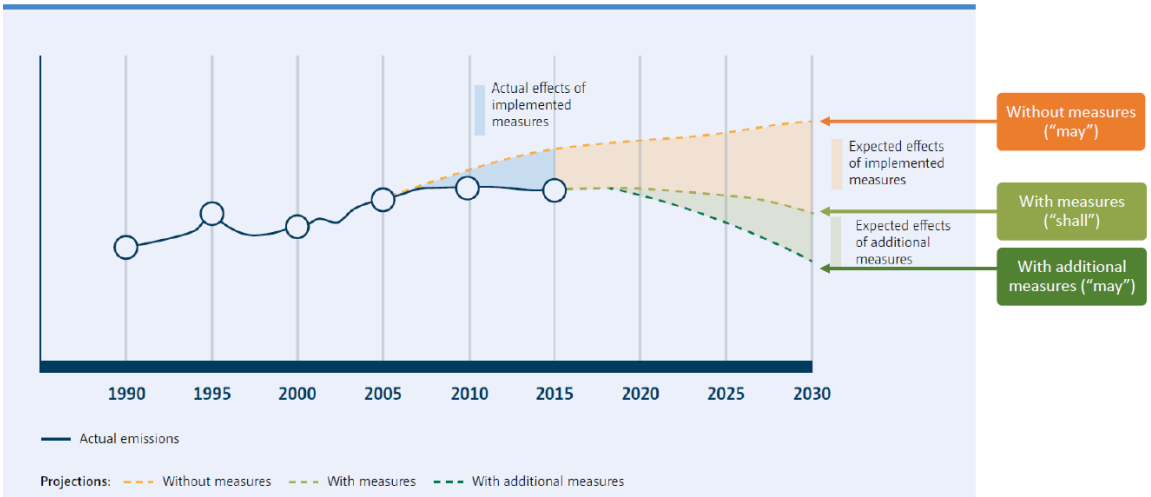


Figure 25. Hypothetical projections of GHG emissions and removals under different scenarios

Baseline scenario

- Baseline scenario projections are used as a reference to set a baseline scenario target. A baseline scenario projection is a hypothetical case that represents future events or conditions most likely to occur in the absence of activities taken to meet a mitigation target.
- According to the MPGs, if a Party has identified a reported projection as its baseline, then this baseline should be used to assess progress towards the implementation and achievement of its NDC.
- Baseline scenario projections are sometimes referred to as business-as-usual (BAU) scenario. Note that business-as-usual scenario could include some implemented and/or adopted policies and measures and, as such, **is not identical to a WOM scenario**.

- Developing baseline scenario projections depend on a wide variety of inputs, such as data on factors that drive emissions (economic activity, energy prices, population growth, etc.), assumptions about how emissions drivers are expected to change over the goal implementation period, and data on the effects of implemented or adopted policies and measures.
- For Parties that adopt baseline scenario targets, baseline scenarios may either be static or dynamic:
    - A static baseline scenario is fixed at the start of the target period and not recalculated over time, so that the target level of emissions in the target year remains fixed.
    - A dynamic baseline scenario is recalculated regularly during the target period based on changes in emissions drivers such as GDP or energy prices, so that the target level of emissions in the target year changes over time.
- It should be emphasized that a dynamic baseline scenario is particularly difficult to implement and review owing to inherent uncertainties and constant changes of underlying assumptions and key variables.

Coverage of projections

Projections shall begin from the most recent year reported in the Party's national inventory report and extend at least 15 years beyond the next year ending in zero or five (e.g. 2025, 2030).

Projected emissions and removals of greenhouse gases are to be reported for each sector, including transport, which is a sub-sector of the energy sector. They are also to be reported separately for each gas.

Projections shall also:

- Use a common metric consistent with the one used in the national inventory report;
- Be presented relative to actual inventory data for the preceding years;
- Be provided with and without LULUCF.
- Reported for key indicators to determine progress towards NDCs

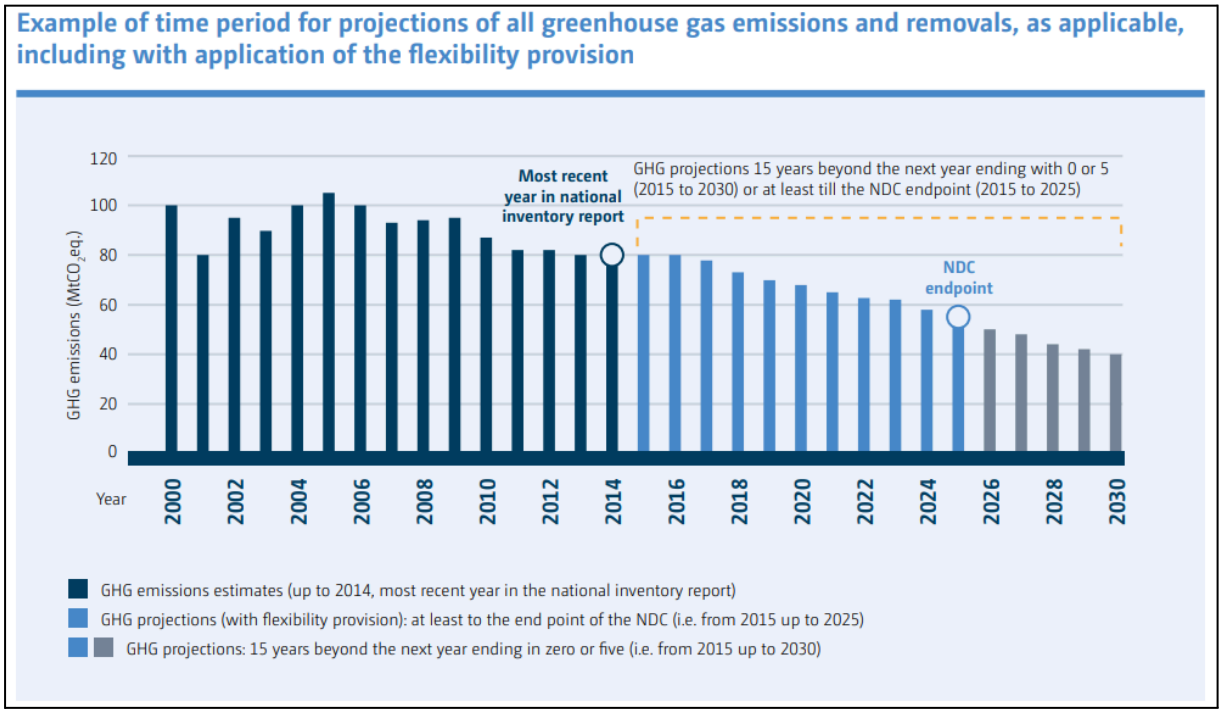


Figure 26. Example of time period for projections of all GHG emissions and removals

<u>Flexibility for developing country Parties</u>

Each Party shall report projections, however those developing country Parties that need flexibility in the light of their capacities may apply the specific flexibility provisions offered to them in the MPGs for reporting some of the information on projections in their BTRs.

Flexibility provided for reporting projections of GHG emissions and removals is as follows:

- Those developing country Parties that need flexibility in the light of their capacities are encouraged to report projections (MPGs, paragraph 92);
- With regards to the timeframe that projections cover, developing countries applying flexibility could extend their projections at least to the end point of their NDC (MPGs, paragraph 95);
- Developing country Parties can use a less detailed methodology or coverage in reporting projections (MPGs, paragraph 102).

Methodologies, parameters, assumptions and sensitivity analysis

Parties should describe the methodology used to develop the projections by including the following:

- Models and/or approaches used and key underlying assumptions and parameters used for projections (e.g. gross domestic product growth rate/level, population growth rate/level);
- Changes in the methodology since the Party's most recent BTR;
- Assumptions on policies and measures included in the "with measures" projections and "with additional measures" projections, if included;
- Sensitivity analysis of any of the projections, together with a brief explanation of the methodologies and parameters used.

❖ Methodologies

Contrary to the case for estimating emissions for national GHG inventories, there are **no prescribed methodologies for the preparation of projections**.

Parties may use any models and approaches at their disposal, and as deemed relevant to their needs and national circumstances, to project future GHG emissions and removals.

Most Parties use an integrated approach to projecting energy-related emissions, whereby macroeconomic top-down models are coupled with sector- and technology-specific bottom-up models. However, the type and characteristics of the models can differ significantly among Parties. In many cases, Parties also use simpler spreadsheets models consistent with methodologies used for preparing their GHG emissions inventories to project emissions from non-energy sources.

All projections of GHG emissions and removals are modelled in some way. The models Parties are using to develop scenarios and estimate GHG emission projections can be broadly classified into four categories:

- **Economy-wide macroeconomic models** (e.g. computable general equilibrium (CGE), dynamic stochastic general equilibrium (DSGE));
- **Sectoral models to project emissions from the energy sector** (e.g.Price-induced Market Equilibrium System (PRIMES), Market Allocation (MARKAL), Integrated Market Allocation-Energy Flow Optimization Model System (TIMES), Model for Energy Supply Strategy Alternatives and their General Environmental Impact (MESSAGE), Low Emissions Analysis Platform (LEAP);

- **Sectoral models to project non-energy related GHG emissions** (e.g. Common Agricultural Policy Regional Impact (CAPRI) for agriculture);
- **Sectoral models to project GHG emissions and removals from land use, land-use change and forestry** (e.g. CLUE, GEONAMICA, IMAGE, LANDSHIFT, PLM, SITE).

❖ Parameters and assumptions

Contrary to the case for estimating emissions for national GHG inventories, there are **no prescribed methodologies for the preparation of projections**.

Models used for preparing projections require a set of parameters and assumptions to estimate projections of future emissions. Non-exhaustive list of the commonly used parameters and assumptions are provided below.

Table 23: Commonly Used Parameters and assumptions

Commonly used parameters:	Commonly used assumptions:
Population growth and structure	Structure of the domestic economy: ● Increase or decrease in manufacturing (production) activities; ● Increase or decrease in services; ● Increase or decrease in agricultural activities.
Gross domestic product growth rates	Technological development trends: ● Energy efficiency improvements of products and services; ● Development of carbon capture and storage infrastructure; ● Increase in electric vehicles and development of supporting infrastructure
Tax rates	Available energy sources and costs: ● Political acceptability of expansion or restructuring of the energy system - nuclear, coal,

	• gas, hydro, renewables, combined heat and power, district heating, etc.; • Country-specific events like annual fluctuations in hydropower availability.
International fossil fuel prices (coal, gas, oil)	The development of energy markets and the impact on GHG emissions: • Regulation or deregulation of domestic energy markets and the electricity market in particular; • Exports and imports of primary or transformed energy; • Availability of natural gas; • Development and introduction of renewable energy; • Future developments in nuclear power (e.g. time needed for the set-up or shutdown of nuclear power plants).
International, regional or domestic carbon prices or taxes	Sector-specific developments: • Expansion or closure of specific industrial activities; • Improvements in agricultural practices (e.g. manure management and use of fertilizers); • Changes in demand for timber, wood products and biomass; • Changes in waste generation rates and waste management practices (landfilling, thermal treatment, recycling, composting).
Heating degree days	
Passenger-kilometres	

Currency exchange rates	
etc.	

❖ Sensitivity analysis

In general, sensitivity analysis investigates how variation in the output of a model can be attributed to variation in its input factors (variables).

Typical questions addressed by sensitivity analysis are:

- What input factors cause the largest variation in the output?
- Is there any factor whose variability has a negligible effect on the output?
- Are there interactions that amplify or dampen the variability induced by individual factors?

The usual steps in any sensitivity analysis are:

1. Selecting which input factors will be subject to sensitivity analysis;

2. Setting the values of other input factors that will be kept constant throughout the sensitivity analysis;

3. Defining the model output (e.g. GHG emissions).

One of the simplest and most common approaches is that of changing one factor at a time to see what effect this has on the output. Sensitivity may then be measured by monitoring changes in the output results.

With regard to GHG emission projections, sensitivity analysis usually involves:

1. Selecting the most influential input variables (e.g. price of oil or natural gas) and quantifying the uncertainty on the basis of changes in underlying assumptions (e.g. range of future fuel prices, rates of gross domestic product, industrial growth rates, etc.);

2. Running the model;

3. Observing changes in the levels of projected GHG emissions as an output of the model.

Sensitivity analysis is useful for testing the robustness of the models used for projections, for understanding the relationships between input and output variables in a model and for identifying errors in a model.

Although reporting information on models used is not mandatory, it is important for transparency and for the assessment of the plausibility and robustness of the projections.

Flexibility for developing country Parties

Each Party shall report projections, however those developing country Parties that need flexibility in the light of their capacities may apply the specific flexibility provisions offered to them in the MPGs for reporting some of the information on projections in their BTRs.

The table below presents the flexibility provisions available to those developing country Parties that need it in the light of their capacities in relation projections of greenhouse gas emissions and removals.

REFERENCE IN THE MPGS (ANNEX TO DECISION 18/CMA.1)	PROVISION IN THE MPGS	FLEXIBILITY PROVISION FOR THOSE DEVELOPING COUNTRY PARTIES THAT NEED IT IN THE LIGHT OF THEIR CAPACITIES
Paragraph 92 *GHG emission and removals projections*	Each Party shall report projections	Instead encouraged to report such projections
Paragraph 95 *Projections extension*	Projections shall begin from the most recent year in the Party's national inventory report and extend at least 15 years beyond the next year ending in zero or five	May extend their projections at least to the end point of their NDC
Paragraph 102 *Projections methodology or coverage*	See paragraphs 93 through 101 of the annex to decision 18/CMA.1	May report using a less detailed methodology or coverage

Figure 27. Flexibility provisions relating to GHG projections

Format of reporting

Annex II to decision 5/CMA.3 contains CTF tables for the electronic reporting of the information on projections. The tables relevant to projections are shown in figure below.

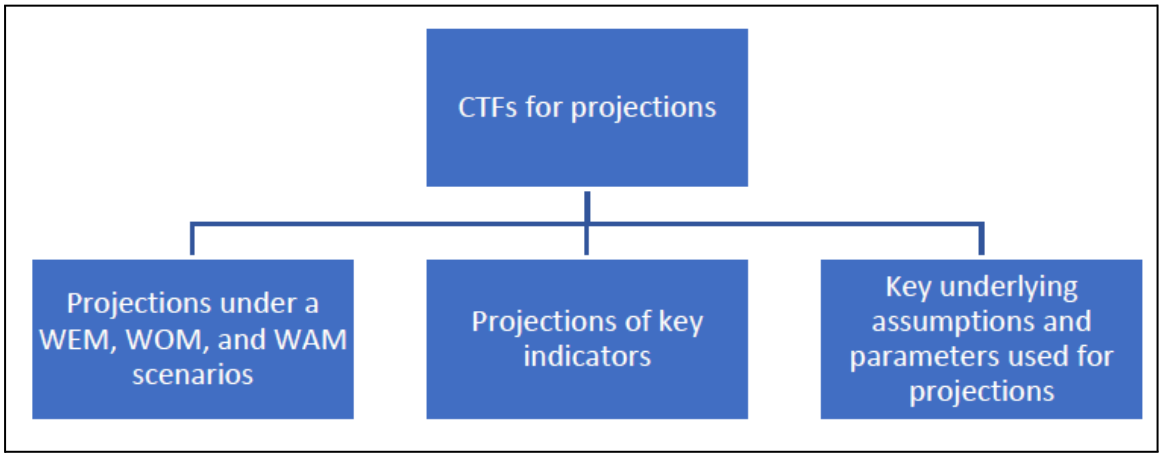


Figure 28: Tables Relevant to Projections

A total of five CTF address the projections of greenhouse gas emissions and removals. CTF 7 to 9 are almost identical; they are intended for reporting 'with measures', with additional measures' and 'without measures' scenarios. Projections are reported in 5-year steps in the CTF7 to 9 tables. Full time series data can be reported in the BTR in tabular or graphical format, if desired.

The CTFs 7 to 9 are very similar to the CTF currently used by developed country Parties for their biennial reporting under the Convention.

7. Information on projections of greenhouse gas emissions and removals under a 'with measures' scenario[a,b]				
	Most recent year in the Party's national inventory report (kt CO_2 eq)[c]	*Projections of GHG emissions and removals (kt CO_2 eq)[c]*		
	20XX	*20X(0)(5)*	*20X(0)(5)*	*20X(0)(5)*
Sector[d]				
Energy				
Transport				
Industrial processes and product use				
Agriculture				
LULUCF				
Waste				
Other (specify)				
Gas				
CO_2 emissions including net CO_2 from LULUCF				
CO_2 emissions excluding net CO_2 from LULUCF				
CH_4 emissions including CH_4 from LULUCF				
CH_4 emissions excluding CH_4 from LULUCF				
N_2O emissions including N_2O from LULUCF				
N_2O emissions excluding N_2O from LULUCF				
HFCs				
PFCs				
SF_6				
NF_3				
Other (specify)				
Total with LULUCF				
Total without LULUCF				

Figure 29. CTF7. Information on projections of greenhouse gas emissions and removals under a 'with measures' scenario

8. Information on projections of greenhouse gas emissions and removals under a 'with additional measures' scenario[a, b]

	Most recent year in the Party's national inventory report (kt CO_2 eq)[c]	*Projections of GHG emissions and removals (kt CO_2 eq)[c]*		
	20XX	*20X(0)(5)*	*20X(0)(5)*	*20X(0)(5)*
Sector[d]				
Energy				
Transport				
Industrial processes and product use				
Agriculture				
LULUCF				
Waste				
Other (specify)				
Gas				
CO_2 emissions including net CO_2 from LULUCF				
CO_2 emissions excluding net CO_2 from LULUCF				
CH_4 emissions including CH_4 from LULUCF				
CH_4 emissions excluding CH_4 from LULUCF				
N_2O emissions including N_2O from LULUCF				
N_2O emissions excluding N_2O from LULUCF				
HFCs				
PFCs				
SF_6				
NF_3				
Other (specify)				
Total with LULUCF				
Total without LULUCF				

Figure 30. CTF8. Information on projections of greenhouse gas emissions and removals under a 'with additional measures' scenario

9. Information on projections of greenhouse gas emissions and removals under a 'without measures' scenario[a, b]

	Most recent year in the Party's national inventory report (kt CO_2 eq)[c]	*Projections of GHG emissions and removals (kt CO_2 eq)*[c]		
	20XX	*20X(0)(5)*	*20X(0)(5)*	*20X(0)(5)*
Sector[d]				
Energy				
Transport				
Industrial processes and product use				
Agriculture				
LULUCF				
Waste				
Other (specify)				
Gas				
CO_2 emissions including net CO_2 from LULUCF				
CO_2 emissions excluding net CO_2 from LULUCF				
CH_4 emissions including CH_4 from LULUCF				
CH_4 emissions excluding CH_4 from LULUCF				
N_2O emissions including N_2O from LULUCF				
N_2O emissions excluding N_2O from LULUCF				
HFCs				
PFCs				
SF_6				
NF_3				
Other (specify)				
Total with LULUCF				
Total without LULUCF				

Figure 31. CTF9. Information on projections of greenhouse gas emissions and removals under a 'without measures' scenario

CTFs 10 and 11 require the reporting of key indicators, and of key underlying assumptions and parameters used for the projections. While key variables and assumptions are already reported by developed country Parties under the Convention, the reporting of key indicators is a new requirement under the Paris Agreement. It is related to the fact that many NDCs contain non-greenhouse gas targets. While the progress towards achieving greenhouse gas targets can be tracked using projections of greenhouse gas emissions and removals (CTFs 7 to 9), the progress towards non-greenhouse gas targets has to be tracked using CTF 11. An example would be to enter, in CTF 11 projected values of the share of renewable energy in total electricity generation, if the Party's NDC contains a renewable electricity target.

10. Projections of key indicators[a,b]

Key indicator(s):[c]	*Unit, as applicable*	*Most recent year in the Party's national inventory report, or the most recent year for which data is available*	*Projections of key indicators*[d]		
		20XX	*20X(0)(5)*	*20X(0)(5)*	*20X(0)(5)*
{Key indicator}					

Figure 32. CTF10. Projections of key indicators

11. Key underlying assumptions and parameters used for projections[a, b]

Key underlying assumptions and parameters[c]	*Unit, as applicable*	*Most recent year in the Party's national inventory report, or the most recent year for which data are available*	*Projections of key underlying assumptions and parameters*[d]		
		20XX	*20X(0)(5)*	*20X(0)(5)*	*20X(0)(5)*
{Key underlying assumption/parameter}					

Figure 33. CTF11. Key underlying assumptions and parameters used for projections

Interlinkage between CTF 10 on projections of key indicators and CTF tables 1, 2 and 4

CTF Table 10 on projections of key indicators is interlinked with CTF tables 1, 2 and 4 as follows: CTF table 1 describes the indicators, CTF table 2 provides additional definitions, CTF table 4 tracks achieved progress and CTF table 10 provides projections on expected future development of these indicators.

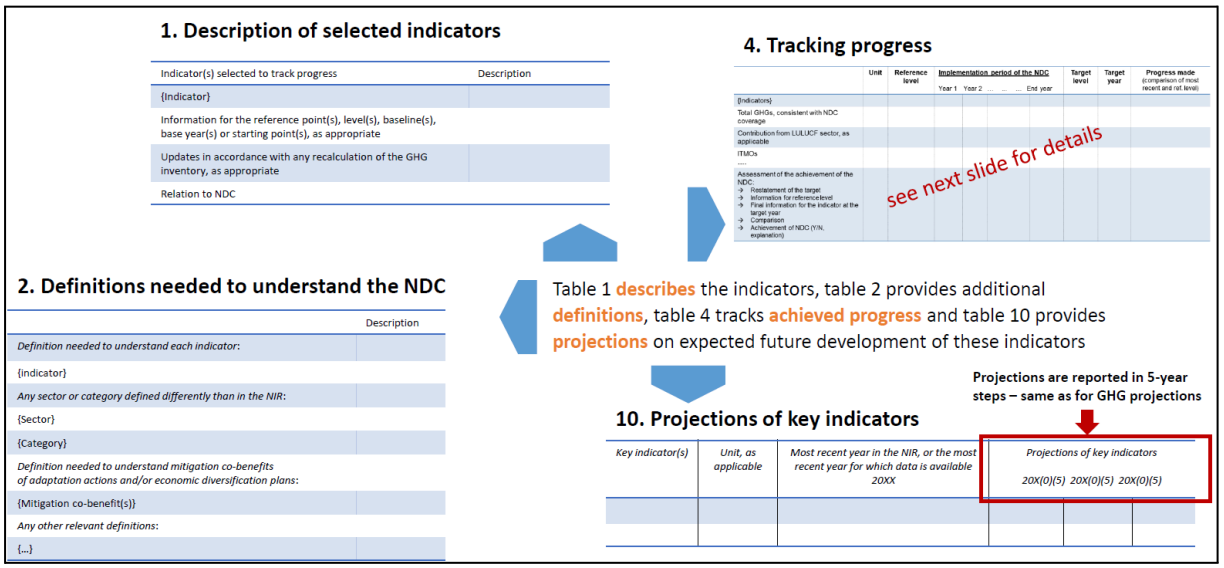


Figure 34: Interlinkage between CTF 10 on projections of key indicators and CTF tables

The Figure below provides a filled-in reporting format for a baseline target with illustration of interlinkages between NDC description table, CTF tables 1,2, 3 and 4, and CTF table 10.

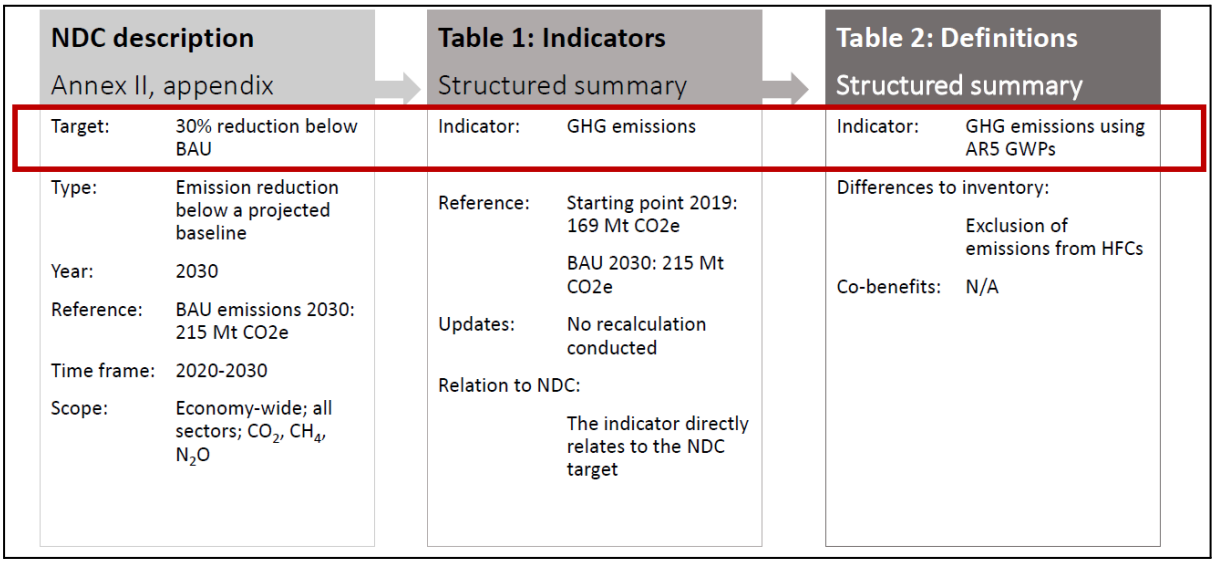


Figure 35: Filled-in Reporting Format for a Baseline Target

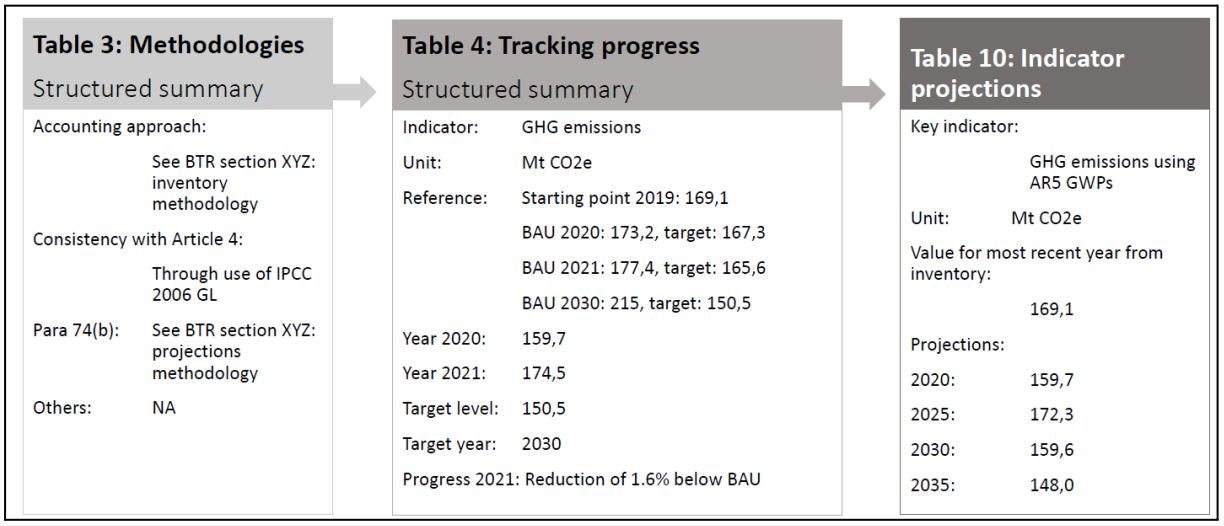


Figure 36: Methodologies, Tracking Progress and Indicator Projections

The table below provides a filled-in reporting format for a quantitative non GHG transport target with illustration of interlinkages between NDC description table, CTF tables 1,2, 3 and 4, and CTF table 10.

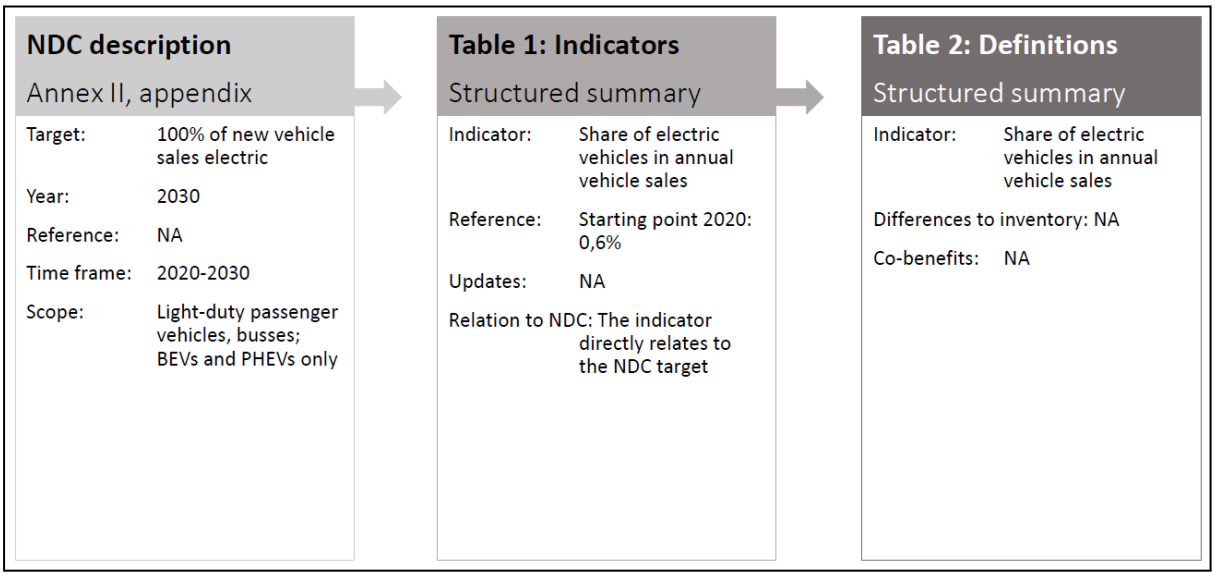


Figure 37: Filled-in Reporting Format for a Quantitative non GHG Transport Target

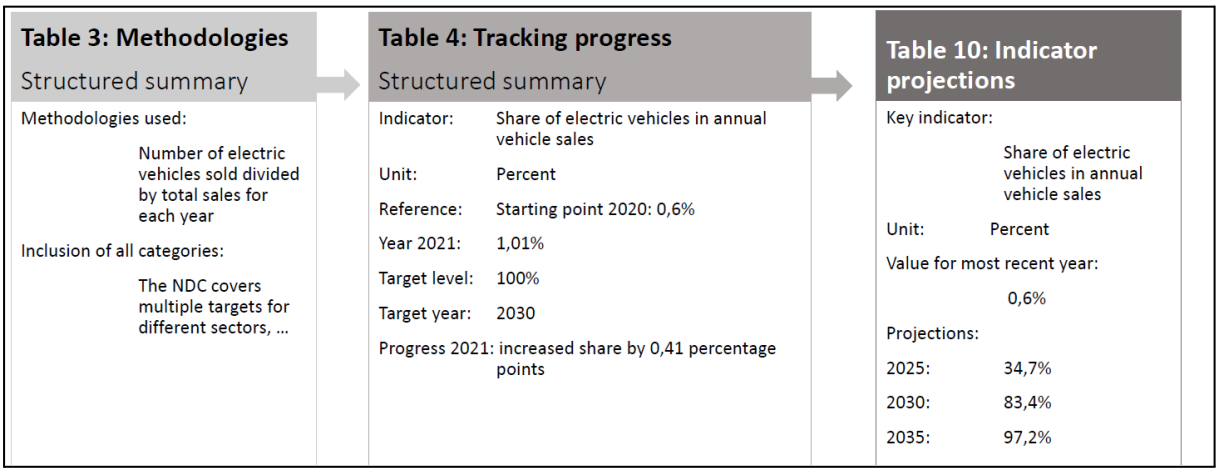


Figure 38: Methodologies, Tracking Progress and Indicator Projections for Quantitative non GHG Transport Targets

b. Data requirements and sources

- **Data**: The data required corresponds directly to the columns of CTF Table 5:
  - Historical data: Time-series data from the National GHG Inventory for all sectors and gases.
  - Activity data & drivers: Historical and projected data for key drivers like GDP growth, population, urbanization rates, industrial production, agricultural production, energy production and consumption, …
  - Policy data: A clear list of policies and measures, categorized as Implemented, Adopted, or Planned, sourced from the NDC 3.0, Energy Transition Plan, and other national strategies.
  - Model parameters: Data on technology costs, fuel prices, energy efficiency improvement rates, and other techno-economic assumptions, ...
- **Sources:**
  - National Bureau of Statistics: For historical and projected macroeconomic data (GDP, population).
  - National GHG Inventory Team: For historical emissions and activity data.
  - Line ministries: For sector-specific plans and policy impacts (e.g., Ministry of Power for renewable energy targets, Ministry of Agriculture for climate-smart agriculture plans).
  - International databases: For assumptions on international fuel prices (e.g., IEA, World Bank) and technology costs.

c. Annual data collection and validation process

Biennial update cycle of projections reported in BTR1: .

- Data gathering: The NCCC/MRV unit coordinates a data call to collect updated macroeconomic forecasts, policy updates, and sectoral plans.
- Model re-run: Projection models are updated with the latest historical data (from the new NID) and revised assumptions.
- Scenario review: The WEM and WAM scenarios are reviewed and updated to reflect changes in the policy landscape (e.g., a planned policy is now adopted).
- Drafting and validation: Draft CTF tables and the narrative are prepared and validated through an inter-ministerial and expert review process.

d. Data quality assurance and control procedures

- Model validation: Compare model outputs for a historical year against the actual GHG inventory data to check for consistency and accuracy.
- Documentation: Maintain comprehensive documentation of all models, assumptions, and data sources used, as required for CTF Table 11.
- Expert peer review: Subject the projection methodology and results to review by independent national or international experts.
- Sensitivity analysis (best practice): Conduct a simple sensitivity analysis for key assumptions (e.g., GDP growth, gas prices) to understand the uncertainty range of the projections and report this qualitatively.

e. Data flow diagram

[Macro data (NBS)] -> [Sectoral plans & policies (line ministries)] -> [Historical GHG data (NID)] -> [Projection modelling team] -> [Draft CTF tables 7, 8, 10, 11] -> [Inter-ministerial & expert review] -> [Final projections chapter in BTR]

f. International best practices

- Smooth modelling approach: Begin with a transparent, spreadsheet-based model if complex integrated modelling is not yet feasible. Transparency is more important than model sophistication.
- Clear policy mapping: Explicitly list which policies are included in the WEM and WAM scenarios, cross-referencing the policies reported in CTF Table 5.
- Explain key assumptions: Be transparent about the most influential assumptions (e.g., "The WAM scenario assumes a GDP growth of 4% per annum and the successful implementation of the 10GW Solar Expansion Plan").
- Use WAM to show the ambition gap: The WAM scenario is a powerful tool to communicate the need for additional policies and international support to close the gap between the WEM projection and the NDC target.
- Link to NDC indicators: Use CTF Table 10 to project non-GHG indicators from the NDC (e.g., renewable energy capacity, forest cover,…), creating a direct link between projected trends and NDC achievement.

g. Examples from other countries

- European Union Member States: Use sophisticated integrated models (like PRIMES, TIMES) to generate detailed WEM and WAM scenarios, with extensive documentation of assumptions.
- Switzerland: Provides a comprehensive and transparent example of projection reporting. A key strength of the Swiss approach is the provision of details on which policies and measures considered under the WEM, WOM and WAM scenarios and the application of projection methodologies tailored to the particular characteristics of each sector, always ensuring consistency with actual data of the greenhouse gas inventory. Other interesting element is the presentation of bifurcation points of the WEM and WOM scenarios for the individual sectors. For the WEM and WAM scenarios, historical data from the most recent greenhouse gas inventory are used, i.e. until 2022. After 2022, the WAM scenario starts to increasingly deviate from the WEM scenario as planned policies and measures (or the planned strengthening of implemented policies and measures) come into force.
- Ghana: As developing countries, Ghana has started reporting projections using simpler, transparent models, focusing on clearly explaining their assumptions and the policies included in their scenarios. Ghana used the GACMO tool to model and generate the

results for the emission projections for all sectors and gas. The base year was 2022, which doubles as the latest actual GHG inventory results. The rest of the emissions are projections under the WM, WAM and WoM until 2040.

Table 24: Examples from Other Countries

Country	Relevant section of the BTR	Pages
European Union	BTR : Please refer to section "3.6 Projections of greenhouse gas emissions and removals" CTF 5	Page 93 to page 104
Switzerland	BTR : Please refer to section "II.F Projections of greenhouse gas emissions and removals" CTF 5	Page 114 to page 148
Ghana	BTR : Please refer to section "2.4. 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" CTF 5	Page 22 to page 39

h. Template for data submission and review

The official templates are the **CTF Tables 7, 8, 10, and 11**.

For internal data collection and modelling, Nigeria should develop a standardized workbook with the following sheets:

- **Input_assumptions:** A sheet structured like CTF Table 11 for collecting macroeconomic and sectoral assumption data from relevant agencies.
- **Policy_mapping:** A sheet to list each policy/measure and designate whether it is in the WEM or WAM scenario.

- **Model_outputs:** Sheets where the projection model populates results in a format that can be directly copied into CTF Tables 7, 8, and 10.
- **Documentation:** A sheet for describing the models used, key methodological choices, and the results of any sensitivity analysis.

This structured internal template will ensure a consistent, transparent, and efficient process for compiling the projection data for the BTR.

7.6 National tracking of NDC progress

National tracking of NDC progress refers to Nigeria's domestic system for regularly monitoring, assessing, and reporting on the implementation and outcomes of its NDC 3.0. This process ensures that progress is systematically measured against both economy-wide and sectoral targets, using a combination of outcome and output indicators. The national tracking system is integrated into Nigeria's broader MRV framework and is designed to feed directly into Biennial Transparency Reports under the ETF.

a. Approach:

Nigeria's national tracking approach is based on a **results-based monitoring framework** that links policy implementation to measurable outcomes. The process involves:

1. Defining clear indicators aligned with NDC 3.0 targets.
2. Establishing data collection protocols across sectors.
3. Aggregating and analyzing data at the national level.
4. Comparing results against baselines and targets to assess progress.
5. Reporting findings through domestic and international channels.

This approach ensures transparency, consistency, and accountability, enabling Nigeria to identify gaps, adjust strategies, and demonstrate compliance with its Paris Agreement commitments.

Outcome indicators

Outcome indicators measure the direct impact of mitigation actions on greenhouse gas emissions and removals. They are used to assess whether Nigeria is on track to achieve its NDC targets.

Table 25: Cross-cutting outcome indicators:

These indicators capture overall national progress towards the economy-wide NDC target, including:

Indicator	Description	Relevance
Total net emissions including LULUCF	Annual emissions from NID	Economy-wide emissions, including LULUCF, compared to the 2018 baseline and the 2030/2035 targets. Core indicator for NDC target pathway
Total national GHG emissions (excl. LULUCF)	Annual emissions from NID	Economy-wide emissions, excluding LULUCF, compared to the 2018 baseline and the 2030/2035 targets.
Economy-wide emissions deviation from BAU (%)	Difference between actual emissions and NDC BAU	Capture deviation from BAU scenario
Emissions intensity per GDP	tCO_2eq/million Naira	Tracks decoupling of economic growth from emissions.
Emissions per capita	tCO_2eq/person	Provides a demographic perspective on mitigation progress.
GHG reductions achieved ($MtCO_2e$)	Absolute reductions compared to reference pathway	Measures achievement
RE share in total energy mix	% of electricity/energy from RE	Key non-GHG indicator
Gas flaring volume and reduction (%)	Annual reduction relative to baseline	Major driver of mitigation
Energy intensity (TPES/GDP)	Trend in energy efficiency	Cross-sectoral indicator
Percentage of unconditional vs. conditional targets achieved	Achievement of unconditional and conditional targets	Highlights the role of international support.

> Sectoral outcome indicators:

Each sector monitors a minimum set of outcome indicators aligned with the NDC 3.0 mitigation contributions:

Energy sector:

- GHG emissions from fuel combustion
- Fugitive emissions reductions, particularly from gas flaring.
- Mitigation achieved from RE, EE and fuel switching
- Gas flaring reductions
- Thermal plant efficiency improvements

IPPU sector:

- Sectoral GHG emissions: Process emissions from industries (cement, steel, and chemicals,…) and HFCs emissions
- Emission reductions from clinker substitution, refrigerant policy implementation
- Phase-down of high-GWP substances

Agriculture sector:

- Reduced methane emissions (livestock, rice)
- Nitrous oxide reductions from fertiliser use

LULUCF sector:

- Net emissions/removals from forestry and land use
- Afforestation / reforestation hectares
- Deforestation rate reduction (% compared to baseline).

Waste sector:

- CH4 reductions from landfills, composting, waste-to-energy
- Increased waste collection/segregation rates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Transparency

Comparison against BAU:

- Sectoral emissions are compared against the BAU trajectory (as modeled in NDC 3.0) to calculate achieved emissions reductions at both sectoral and national levels.

Output/activity indicators

Output indicators track the implementation of specific mitigation actions, providing early signals of progress and helping to explain outcome trends.

Energy sector:

- Renewable energy capacity added (MW): Solar, hydro, and wind installations.
- Number of gas flare sites eliminated.
- Volume of natural gas utilized vs. flared (m^3).
- Number of mini-grids
- LPG adoption rates

Transport sector:

- Number of electric vehicles (EVs) registered.
- Kilometers of Bus Rapid Transit (BRT) lanes developed.
- Percentage of public transport fleet converted to CNG.

Agriculture & LULUCF:

- Hectares of land under climate-smart agriculture.
- Area of forest restored or under sustainable management (ha).
- Number of efficient cookstoves distributed.

Waste sector:

- Quantity of waste diverted from landfills (tons).
- Number of operational methane capture facilities.

Cross-cutting:

- Amount of climate finance mobilized (USD).
- Number of policies/regulations enacted or revised.

b. Data requirements and sources

Data:

- Activity data : e.g., fuel consumption, ivestock numbers, waste composition, forest cover,...
- Emission factors : IPCC default or Nigeria-specific.
- Output data from mitigation measures
- GHG emissions from NID/NIR
- Policy implementation reports

  Financial flow data.

Table 26: Main data Sources per sector

Sector	Main data providers
Energy	Ministry of Power, ECN, NNPC Ltd., DisCos
Oil and Gas	NNPC Ltd., NUPRC
Transport	Federal Ministry of Transport
Agriculture	FMARD, RIFAN, state agriculture bureaus
LULUCF	FRIN, REDD+, National Forestry Commission
Waste	State/local governments, FMEnv, NESREA
Cross-cutting	NBS, Ministry of Finance, FMEnv

c. Annual data collection and validation process

1. **Data call circular:** The NCCC Secretariat issues annual NDC tracking templates (indicators + PaMs forms) and an annual data request to all relevant MDAs, specifying indicators, formats, and deadlines (by Q1 each year).
2. **Sectoral submission:** MDAs populate the templates using available administrative and statistical data, compile and validate data using standardized templates and submit to the NCCC by Q2
3. **Central compilation:** The NCCC aggregates and checks data for completeness and consistency.

4. **Technical validation:** Inter-agency technical working groups (TWGs) review sectoral submissions, resolve discrepancies, and approve the dataset.
5. **Quality assurance:** Data undergoes QA/QC checks, including cross-verification with independent sources (e.g., satellite data, surveys).
6. **Progress assessment:** The NCCC calculates indicator values, compares them with baselines and targets, and drafts the annual progress report.

Final validated dataset archived and integrated into national tracking and BTR preparation.

d. Data quality assurance and control procedures

QC

- Verification of emission factors
- Detection of outliers and abnormal trends
- Documentation of recalculations

QA

- Use of standardised templates and definitions
- Consistency with NIR methodology
- Cross-checking against national statistics
- Peer Review: Data and methodologies are reviewed by independent national experts.
- Third-Party Verification: For high-impact sectors (e.g., oil and gas), third-party verification may be used

Archiving

- data, methodologies, and validation records are stored in a central repository managed by the NCCC.
- Traceability of all datasets used
- Version control logs

e. **Data flow diagram**

[Sectoral MDAs] -> [Data submission via templates] -> [NCCC Secretariat]

↓

[Data compilation & validation] -> [Inter-agency TWG review]

↓

[QA/QC & uncertainty analysis] -> [Central database]

↓

[Progress assessment & report drafting] -> [Annual NDC Progress Report]

↓

[Feedback to MDAs & policy adjustment]

f. **International best practices**

- Use of digital MRV platforms for real-time data tracking
- Integration of remote sensing and IoT for enhanced accuracy in LULUCF and energy sectors.
- Stakeholder engagement in indicator selection and data validation
- Regular capacity building for data providers to ensure consistency and reliability.

g. **Examples from other countries**

South Africa - Integrated national MRV system[20]

South Africa has developed one of the most advanced and comprehensive national MRV and transparency systems in Africa, integrated into its broader climate policy framework. It extends beyond just greenhouse gas inventories to cover mitigation actions, co-benefits, and a range of atmospheric emissions.

Key features of this system are as follows:

[20]https://ndcpartnership.org/knowledge-portal/good-practice-database/integrated-mrv-system-south-africa#:~:text=South%20Africa%20is%20among%20the,and%20Verification%20(MRV)%20requirements.

- Comprehensive MRV integration across mitigation, adaptation, and atmospheric emissions.
- Uses a web-based National Atmospheric Emissions Inventory System (NAEIS) covering energy, transport, industrial and other sectors.
- System supports data collection, regular tracking, and reporting aligned with international requirements, including BTRs and ETF compliance.
- Linked to a National Climate Change Response Database to store policies, measures, and tracking metrics.

The key strengths of this system are as follows

- Strong institutional foundation with participatory technical working groups.
- Provides continuous assessment and feedback, rather than ad hoc reporting.
- Enables cross-sector integration and technical harmonization across national, provincial and local levels.

Uganda - Sectoral NDC tracking framework[21]

Uganda has operationalized a sectoral NDC tracking framework -supported by initiative for Climate Action Transparency (ICAT) - specifically in *transport* and *waste*, which are priority sectors for its NDC.

Key features of this system are as follows:

- Combines SMART indicators (Specific, Measurable, Achievable, Realistic, Time-bound) to monitor sector-level outcomes.
- Data collection templates were standardised with custodian and methodology fields.
- Excel-based calculation templates automated GHG and mitigation quantification for reliability.
- Institutional roles and custodians for each indicator defined clearly enabling national-level data flows.

The key strengths of this system are as follows

- Sector-led engagement ensures operational relevance to government decision-making.
- Built on stakeholder consultation and capacity building to enhance data reliability.

[21] https://climateactiontransparency.org/uganda-achieves-milestone-in-tracking-sectoral-climate-progress/

- Provides a blueprint for scaling to economy-wide NDC tracking.

Cuba - ICAT supported NDC tracking frameworks[22]

Through ICAT project, Cuba established an effective MRV framework for tracking progress towards its NDC targets; the process uncovered an under-estimation of the expected emissions reductions

The new MRV framework allowed Cuba to collect and process relevant data. This showed that the country had under-estimated the reduction in emissions (in renewable energy, energy savings, and transport) in its original calculations. The recalculation increased the volume of emissions avoided (2014-2030) through Cuba's NDCs by 33.2 million tonnes CO2eq (8.3 per cent higher than the initial NDC estimate). It also showed an error in the initial NDC, revealing a reduction of 1 million tonnes CO2eq from transport from 2022 to 2030. Finally, a reduction of 1.19 million tonnes CO2eq by 2030 was discovered, which represented an almost 80 per cent reduction from the 700 thousand tons CO2eq reduction declared in the NDC.

Thanks to the success of this project, Cuba is now able to monitor implementation of all five of its NDC mitigation targets and report on its NDCs under the Paris Agreement as part of the first biennial transparency reports, due in 2024.

The key strengths of this system are as follows

- Focus on baseline establishment ensures that progress tracking is grounded in solid initial assessments.
- Stakeholder training is central, building national operational capacity for ongoing transparency.
- Provides examples for countries with more nascent systems on how to structure NDC tracking incrementally.

[22] https://climateactiontransparency.org/report2023/enhanced-ndc-tracking-framework.html

h. Template for data submission and review:

Table 27: Template A - Outcome indicators

Indicator name	
Indicator definition	
Reporting year	
Data value (latest value and historic values)	
Unit	
Baseline	
Target	
Annual progress	
Methodology	
Data source	
Uncertainty level	
Responsible MDA	
Validation: Validation status Reviewer Validation outcome Issues identified Resolution	

Table 28: Template B - Output/activity indicators

Mitigation measure name	
Indicator name	

Indicator definition	
Reporting year	
Data value (latest value and historic values)	
Unit	
Baseline	
Target	
Annual progress	
Methodology	
Data source	
Uncertainty level	
Responsible MDA	
Validation : Validation status Reviewer Validation outcome Issues identified Resolution	

In addition to tracking mitigation outcomes and emission reductions, the national NDC tracking framework will also capture key implementation management indicators for major mitigation policies and measures. These may include information on financing status (secured or pending), estimated funding gaps, implementation readiness, and key delivery risks. Incorporating these elements will enable the tracking system to support not only reporting under the ETF, but also implementation management and early identification of challenges. Where implementation progress or reporting appears off-track, responsible institutions may be requested to provide updates or corrective actions through the regular MRV cycle, thereby supporting timely course correction and improved delivery of NDC commitments.

7.6.1 Tracking Action for Climate Empowerment (ACE)

In addition to tracking greenhouse gas emissions and sectoral mitigation performance, the national NDC tracking framework will incorporate indicators for Action for Climate Empowerment (ACE) in line with Article 12 of the Paris Agreement, which promotes climate education, training, public awareness, public participation, and access to information. Integrating ACE within the national tracking framework will ensure that the human and institutional dimensions of climate action are systematically captured alongside technical mitigation outcomes and reported in alignment with the Enhanced Transparency Framework (ETF).

To operationalize this, the guidelines will incorporate a set of ACE-specific Key Performance Indicators (KPIs) covering three core dimensions. Education and training indicators will track the number of climate-integrated curricula introduced in educational institutions, as well as climate-related training programmes and technical or vocational capacity-building initiatives implemented across sectors. Public awareness indicators will capture the reach of climate information campaigns, access to climate-related information platforms, and measurable improvements in national climate literacy. Participation indicators will monitor the extent of stakeholder engagement in climate policy processes, including the participation of women, youth, local communities, and other vulnerable groups in consultations, decision-making processes, and climate action initiatives. These indicators will be reported through standardized reporting templates aligned with the Common Tabular Formats (CTFs) used for national climate reporting and integrated into the national MRV system.

Institutional coordination for ACE tracking will be led by the NCCC in accordance with the Climate Change Act. The NCCC will serve as the central coordinating authority responsible for consolidating ACE-related data, ensuring methodological consistency, and integrating ACE reporting within national NDC progress assessments. Sectoral MDAs particularly those responsible for education, environment, information, youth development, and community engagement will contribute data through standardized reporting templates and digital data collection tools designed to capture engagement levels, training activities, awareness initiatives, and participation metrics. An inter-ministerial coordination mechanism or working group may be established to facilitate data sharing, strengthen governance of ACE indicators, and ensure consistent reporting across sectors.

To strengthen implementation, ACE will also be mainstreamed within sectoral climate programmes and initiatives, ensuring that climate education, awareness-building, and stakeholder engagement are integrated into major mitigation and adaptation actions. This approach will complement existing

budgetary provisions, including the currently earmarked allocation for ACE-related activities, while supporting the integration of ACE components within high-impact programmes such as energy transition initiatives, waste-to-energy programmes, and other sectoral climate investments.

Integrating ACE indicators within the national tracking framework will also help demonstrate how public engagement and capacity building contribute to mitigation outcomes. Increased climate awareness and technical capacity can support greater uptake of low-carbon and climate-resilient technologies, improve community-level compliance with environmental regulations, and strengthen public acceptance of climate policies and measures. Enhanced stakeholder participation may also reduce implementation risks for major mitigation programmes by fostering stronger public ownership and support for climate action.

ACE indicators will be incorporated into the national MRV cycle, enabling periodic reporting, review, and inclusion in national climate reporting processes, including BTRs under the ETF.

8. Monitoring, Reporting, and Verification cycle

The Monitoring, Reporting, and Verification cycle refers to the structured, recurring process through which Nigeria collects, validates, analyzes, and reports data on NDC implementation. This cycle ensures that Nigeria meets its domestic and international transparency obligations under the Paris Agreement.

8.1 Annual internal tracking cycle

This cycle focuses on domestic data collection and progress assessment to inform policy-making and prepare for international reporting.

Steps and timeline:

1. Launch of cycle and planning (January - March):
    - NCCC updates the annual data collection plan and circulates MRV templates for NDC indicators and PaMs
    - MDAs assign focal points and allocate resources.
2. Data collection and sector-level validation (April - June):
    - MDAs collect activity and output data.
    - NCCC provides technical support and training as needed.
    - Internal technical checks by sector MRV Units.
3. Data submission & validation (July - September):
    - MDAs submit data using standardized templates.
    - National technical review
    - NCCC and TWGs conduct validation workshops.
4. Analysis & reporting (October - December):
    - NCCC compiles data, calculates indicators, and drafts the Annual NDC Progress Report.
    - Report is reviewed by the National Council on Climate Change and published

Workflow:

Annual kick-off -> Data collection -> Validation -> Analysis -> Draft report -> Review -> Publication -> Feedback loop

8.2 Biennial transparency report cycle

This cycle aligns with Nigeria's international obligations under the ETF, requiring submission of a BTR every two years. The BTR cycle builds directly on the annual tracking cycle. Each BTR uses the two most recent years of annual data, ensuring that international reporting is rooted in robust domestic systems.

Steps and timeline:

1. Preparation (12-18 months before submission):
    - NCCC establishes a BTR Task Team.
    - Data from the annual tracking cycle is consolidated.
    - CTF tables are populated using verified data.
2. Drafting (6 - 12 months before submission):
    - Narrative sections are drafted, referencing CTF tables.
    - Internal consistency checks are performed.
3. Review & approval (3- 6 months before submission):
    - Inter-ministerial review committee examines the draft.
    - Independent technical experts provide feedback.
    - NCCC incorporates comments and finalizes the report.
4. Submission (By 31 December of the reporting year):

- Final BTR is submitted to the UNFCCC via the designated portal.

5. Post-submission:
    - Report undergoes international Technical Expert Review (TER).
    - Nigeria responds to TER findings and corrects any issues.

Workflow:

BTR planning -> Data consolidation -> CTF completion -> Narrative drafting -> Internal review -> Finalization -> UNFCCC submission -> TER engagement

Annex 1: Filling CTFs related to tracking progress made in implementing NDC global targets_ Examples from other Countries

Table 29: Filled CTF table "1. Structured summary: Description of selected indicators" for Switzerland BTR1

Indicator(s) selected to track progress[a]	*Description*
Total emissions and removals	Total CO2 equivalent emissions, including indirect CO2, with LULUCF
Information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate[b]	52098.58 kt CO2eq (1990)
Updates in accordance with any recalculation of the GHG inventory, as appropriate[b]	52098.58 kt CO2eq
Relation to NDC[c]	Cumulative absolute economy-wide net emissions as reported in the national greenhouse gas inventory over the period 2021–2030 will be compared to the target of the NDC (after application of corresponding adjustments involving the use of ITMOs).

Table 30: Filled CTF table "2. Structured summary: Definitions needed to understand the NDC" for Switzerland BTR1

	Definitions[a]
Definition needed to understand each indicator:	
Total emissions and removals	Total CO2 equivalent emissions and removals of all gases (CO2, CH4, N2O, HFCs, PFCs, SF6, NF3, and indirect CO2) from all sectors (1, 2, 3, 4, 5, and 6) as reported in the national greenhouse gas inventory.
Any sector or category is defined differently than in the national inventory report:	NA
Definition needed to understand mitigation co-benefits of adaptation actions and/or economic diversification plans:	NA
Any other relevant definitions	NA

Table 31: Filled CTF table "3. Structured summary: Methodologies and accounting approaches - consistency with Article 4, paragraphs 13 and 14, of the Paris Agreement and with decision 4/CMA.1" for Switzerland BTR1

Reporting requirement	*Description or reference to the relevant section of the BTR*
For the first NDC under Article 4:[a]	
Accounting approach, including how it is consistent with Article 4, paragraphs 13–14, of the Paris Agreement (para. 71 of the MPGs)	The accounting approach is based on the national greenhouse gas inventory. By doing so, scope, coverage, data sources, assumptions, methodologies, and metrics are fully consistent between Switzerland's first NDC and the greenhouse gas inventory. The methodologies used ensure transparency, accuracy, completeness, consistency and comparability as far as can be achieved and avoid any double-counting of emissions and removals, consistent with decisions 4/CMA.1 and 18/CMA.1.
For the second and subsequent NDC under Article 4, and optionally for the first NDC under Article 4:[b]	
Information on how the accounting approach used is consistent with paragraphs 13–17 and annex II of decision 4/CMA.1 (para. 72 of the MPGs)	The accounting approach is based on the national greenhouse gas inventory. By doing so, scope, coverage, data sources, assumptions, methodologies, and metrics are fully consistent between Switzerland's first NDC and the greenhouse gas inventory. The methodologies used ensure transparency, accuracy, completeness, consistency and comparability as far as can be achieved and avoid any double-counting of emissions and removals, consistent with decisions 4/CMA.1 and 18/CMA.1.
Explain how the accounting for anthropogenic emissions and removals is in accordance with methodologies and common metrics assessed by the IPCC and in accordance with decision 18/CMA.1 (para. 1(a) of annex II to decision 4/CMA.1)	The national greenhouse gas inventory is relying on metrics and guidance agreed upon by the CMA and methodologies and good practice guidance from the IPCC in order to provide a sound quantitative framework for accounting of anthropogenic emissions and removals. In order to foster environmental integrity and to reduce uncertainty due to assumptions

	regarding extrapolated management practices and other parameters influencing the calculation of reference levels, Switzerland decided to use net accounting of emissions and removals in the LULUCF sector from 2021 onwards. This update of the accounting methodology compared to the methodology used under the Kyoto Protocol is also going to be reflected in the national legislation (CO2 ordinance).
Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1)	Accounting is based on the national greenhouse gas inventory, therefore it is fully consistent.
Explain how overestimation or underestimation has been avoided for any projected emissions and removals used for accounting (para. 2(c) of annex II to decision 4/CMA.1)	NA
For each NDC under Article 4:[b]	
Accounting for anthropogenic emissions and removals in accordance with methodologies and common metrics assessed by the IPCC and adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (para. 12(a) of decision 4/CMA.1 and para 1 of its annex II):	
Each methodology and/or accounting approach used to assess the implementation and achievement of the target(s), as applicable (para. 74(a) of the MPGs)	Cumulative absolute economy-wide net emissions as reported in the national greenhouse gas inventory over the period 2021–2030 will be compared to the target of the NDC (after application of corresponding adjustments involving the use of ITMOs).
Each methodology and/or accounting approach used for the construction of any baseline, to the extent possible (para. 74(b) of the MPGs)	Net base year emissions (1990) according to the national greenhouse gas inventory.
If the methodology or accounting approach used for the indicator(s) in table 1 differ from those used to assess the implementation and achievement the target, describe each methodology or accounting approach used to generate the information generated for each indicator in table 4 (para. 74(c) of the MPGs)	Approach as used for the indicator in table 1.
Any conditions and assumptions relevant to the achievement of the NDC under Article 4, as applicable and available (para. 75(i) of the MPGs)	NA

Key parameters, assumptions, definitions, data sources and models used, as applicable and available (para. 75(a) of the MPGs)	National greenhouse gas inventory.
IPCC Guidelines used, as applicable and available (para. 75(b) of the MPGs)	2006 IPCC guidelines, 2019 Refinement to the 2006 IPCC guidelines, or any subsequent version or refinement of the IPCC guidelines agreed upon by the CMA, as per decisions 4/CMA.1, paragraph 12.(a) and 18/CMA.1, paragraph 20; 2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol (IPCC 2014 KP Supplement) by the IPCC, as per decisions 2/CMP.6 and 2/CMP.7; 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands (IPCC 2014 Wetlands Supplement).
Report the metrics used, as applicable and available (para. 75(c) of the MPGs)	100-yr GWP values from the 5th IPCC assessment report, or from a subsequent IPCC assessment report as agreed upon by the CMA, as per decision 18/CMA.1 paragraph 37.
For Parties whose NDC cannot be accounted for using methodologies covered by IPCC guidelines, provide information on their own methodology used, including for NDCs, pursuant to Article 4, paragraph 6, of the Paris Agreement, if applicable (para. 1(b) of annex II to decision 4/CMA.1)	NA
Provide information on methodologies used to track progress arising from the implementation of policies and measures, as appropriate (para. 1(d) of annex II to decision 4/CMA.1)	NA
Where applicable to its NDC, any sector-, category or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, taking into account any relevant decision under the Convention, as applicable (para. 75(d) of the MPGs):	
For Parties that address emissions and subsequent removals from natural disturbances on managed lands, provide detailed information on the approach hused and how it is consistent with relevant IPCC guidance, as appropriate, or indicate the relevant section of the national GHG inventory report containing that information (para. 1(e) of annex II to decision 4/CMA.1, para. 75(d)(i) of the MPGs)	No provisions for natural disturbances will be applied.
For Parties that account for emissions and removals from harvested wood products, provide detailed information on which IPCC approach has been used to estimate emissions and removals (para. 1(f) of annex II to decision 4/CMA.1, para. 75(d)(ii) of the MPGs)	Harvested wood products are accounted for using a production approach (only wood from domestic harvest), consistent with the 2013 Revised Supplementary Methods and Good

	Practice Guidance Arising from the Kyoto Protocol (IPCC 2014 KP Supplement).
For Parties that address the effects of age-class structure in forests, provide detailed information on the approach used and how this is consistent with relevant IPCC guidance, as appropriate (para. 1(g) of annex II to decision 4/CMA.1, para. 75(d)(iii) of the MPGs)	NA
How the Party has drawn on existing methods and guidance established under the Convention and its related legal instruments, as appropriate, if applicable (para. 1(c) of annex II to decision 4/CMA.1)	The national greenhouse gas inventory is relying on metrics and guidance agreed upon by the CMA and methodologies and good practice guidance from the IPCC in order to provide a sound quantitative framework for accounting of anthropogenic emissions and removals. In order to foster environmental integrity and to reduce uncertainty due to assumptions regarding extrapolated management practices and other parameters influencing the calculation of reference levels, Switzerland decided to use net accounting of emissions and removals in the LULUCF sector from 2021 onwards. This update of the accounting methodology compared to the methodology used under the Kyoto Protocol is also going to be reflected in the national legislation (CO2 ordinance).
Any methodologies used to account for mitigation benefits of adaptation actions and/or economic diversification plans (para. 75(e) of the MPGs)	NA
Describe how double counting of net GHG emission reductions has been avoided, including in accordance with guidance developed related to Article 6 if relevant (para. 76(d) of the MPGs)	Switzerland will implement the guidance on cooperative approaches referred to in Article 6, paragraph 2 of the Paris Agreement, adopted at COP26, as well as further guidance to be adopted on Article 6, to apply robust rules that avoid any form of double counting, ensure environmental integrity and promote sustainable development, including the protection of human rights, and not to use pre-2020 units towards the achievement of its first NDC. Switzerland already signed bilateral agreements with various countries (see www.bafu.admin.ch/bilateral-climate-agreemen

	ts), creating the necessary frameworks for cooperative approaches under Article 6.2 of the Paris Agreement. The agreements govern the transfers of mitigation outcomes and their use. ITMOs may also be used for other international mitigation purposes, such as e.g. voluntary climate targets by private or sub-state actors. In this case, they would not be counted towards Switzerland's NDC.
Any other methodologies related to the NDC under Article 4 (para. 75(h) of the MPGs)	NA
Ensuring methodological consistency, including on baselines, between the communication and implementation of NDCs (para. 12(b) of the decision 4/CMA.1 and para 1 of its annex II)):	
Explain how consistency has been maintained in scope and coverage, definitions, data sources, metrics, assumptions and methodological approaches including on baselines, between the communication and implementation of NDCs (para. 2(a) of annex II to decision 4/CMA.1)	Communication and implementation of NDC rely on the same principles and are therefore considered consistent.
Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1) and explain methodological inconsistencies with the Party's most recent national inventory report, if applicable (para. 76(c) of the MPGs)	Any recalculations are transparently reported in the national inventory document.
For Parties that apply technical changes to update reference points, reference levels or projections, the changes should reflect either of the following (para. 2(d) of annex II to decision 4/CMA.1):	
Explain how any methodological changes and technical updates made during the implementation of their NDC were transparently reported (para. 2(e) of annex II to decision 4/CMA.1)	Any recalculations are transparently reported in the national inventory document.
Striving to include all categories of anthropogenic emissions or removals in the NDC and, once a source, sink or activity is included, continuing to include it *(para. 12 (c) of decision 4/CMA.1 and para. 3 of annex II to decision 4/CMA.1):*	
Explain how all categories of anthropogenic emissions and removals corresponding to their NDC were accounted for (para. 3(a) of annex II to decision 4/CMA.1)	Switzerland includes all categories of anthropogenic emissions by sources or removals by sinks in its first NDC, as reported in its national greenhouse gas inventory.

Explain how Party is striving to include all categories of anthropogenic emissions and removals in its NDC, and, once a source, sink or activity is included, continue to include it (para. 3(b) of annex II to decision 4/CMA.1)	NA
Provide an explanation of why any categories of anthropogenic emissions or removals are excluded (para. 12 (c) of decision 4/CMA.1 and para. 4 of annex II to decision 4/CMA.1)	NA
Each Party that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4, or authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of its NDC	
Provide information on any methodologies associated with any cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 (para. 75(f) of the MPGs)	Switzerland follows the methodologies provided in decision 2/CMA.3.
Provide information on how each cooperative approach promotes sustainable development, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	Up-to-date information is available in Switzerland's latest Initial Report.
Provide information on how each cooperative approach ensures environmental integrity consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	Up-to-date information is available in Switzerland's latest Initial Report.
Provide information on how each cooperative approach ensures transparency, including in governance, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	Up-to-date information is available in Switzerland's latest Initial Report.
Provide information on how each cooperative approach applies robust accounting to ensure, inter alia, the avoidance of double counting, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	Up-to-date information is available in Switzerland's latest Initial Report.
Any other information consistent with decisions adopted by the CMA on reporting under Article 6 (para. 77(d)(iii) of the MPGs)	Up-to-date information is available in Switzerland's latest Initial Report.

Table 32: Filled CTF table "4. Structured summary: Tracking progress made in implementing and achieving the NDC under Article 4 of the Paris Agreement" for Switzerland BTR1

	Unit, as applicable	*Reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate (paras. 67 and 77(a)(i) of the MPGs)* **1990-1990**	*Implementation period of the NDC covering information for previous reporting years, as applicable, and the most recent year, including the end year or end of period (paras. 68 and 77(a)(ii–iii) of the MPGs)* **2021**	**2022**	*Target level*[b]	*Target year or period*	*Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s) (paras. 69–70 of the MPGs)*
Indicator(s) selected to track progress of the NDC or portion of NDC under Article 4 of the Paris Agreement (paras. 65 and 77(a) of the MPGs):							
Total emissions and removals	kt CO_2 equivalent	52098,58	43 863,87	42 063,52	338 640,74	2021-2030	As Switzerland's absolute economy-wide emission reduction target is implemented as an emission budget covering the years 2021–2030, tracking progress – while the period

							for implementation of the first nationally determined contribution is still ongoing – is challenging. Nevertheless, a target assessment (comparison with a hypothetical linear trend) is reported and discussed in section II.C.1.3 of Switzerland's biennial transparency report.
Where applicable, total GHG emissions and removals consistent with the coverage of the NDC (para. 77(b) of the MPGs)	kt CO_2 equivalent		43 863,87	42 063,52			
Contribution from the LULUCF sector for each year of the target period or target year, if not included in the inventory time series of total net GHG emissions and removals, as applicable (para. 77(c) of the MPGs)	kt CO_2 equivalent		NA	NA			
Each Party that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 of the Paris Agreement or authorizes the use of mitigation outcomes for international mitigation purposes other than							

achievement of the NDC, shall provide (para. 77(d) of the MPGs):							
If applicable, multi-year emissions trajectory, trajectories or budget for its NDC implementation period that is consistent with the NDC (para. 7(b), annex to decision 2/CMA.3)	kt CO_2 equivalent		338 640,74	338 640,74			
Annual anthropogenic emissions by sources and removals by sinks covered by its NDC or, where applicable, from the emission or sink categories as identified by the host Party pursuant to paragraph 10 of annex to decision 2/CMA.3 (para. 23(a), annex to decision 2/CMA.3) (as part of para. 77 (d)(i) of the MPGs)	kt CO_2 equivalent		43 863,87	42 063,52			
Annual quantity of ITMOs first transferred (para. 23(c), annex to decision 2/CMA.3) (para. 77(d)(ii) of the MPGs)	kt CO_2 equivalent		0,00	0,00			
Annual quantity of mitigation outcomes authorized for use for other international mitigation purposes and entities authorized to use such mitigation outcomes, as appropriate (para. 23(d), annex to decision 2/CMA.3) (para. 77(d)(ii) of the MPGs)	kt CO_2 equivalent		0,00	0,00			
Annual quantity of ITMOs used towards achievement of the NDC (para. 23(e), annex to decision 2/CMA.3) (para. 77(d)(ii) of the MPGs)	kt CO_2 equivalent		0,00	0,00			

Net annual quantity of ITMOs resulting from paras. 23(c)-(e), annex to decision 2/CMA.3 (para. 23(f), annex to decision 2/CMA.3)	kt CO_2 equivalent		0,00	0,00			
Total quantitative corresponding adjustments used to calculate the emissions balance referred to in para. 23(k)(i), annex to decision 2/CMA.3, in accordance with the Party's method for applying corresponding adjustments consistent with section III.B, annex to decision 2/CMA.3 (Application of corresponding adjustments) (para. 23(g), annex to decision 2/CMA.3)	kt CO_2 equivalent		0,00	0,00			
The cumulative information in respect of the annual information in para. 23(f), annex to decision 2/CMA.3, as applicable (para. 23(h), annex to decision 2/CMA.3)	kt CO_2 equivalent		0,00	0,00			
For metrics in tonnes of CO_2 eq. or non-GHG, an annual emissions balance consistent with chapter III.B (Application of corresponding adjustment), annex, decision 2/CMA.3 (para. 23(k)(i), annex to decision 2/CMA.3) (as part of para. 77 (d)(ii) of the MPGs)	kt CO_2 equivalent		43 863,87	42 063,52			

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