NIGERIA – ICAT PHASE II PROJECT INCEPTION REPORT (Technical)

Initiative for Climate Action Transparency (ICAT) –
Set up of Sectoral MRV Systems for Nigeria

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Abbreviations

AD	Activity Data
AfDB	African Development Bank
AFOLU	Agriculture, Forestry and Other Land Use (AFOLU)
BUR	Biennial Update Reports
BUR1	First Biennial Update Report
CBN	Central Bank of Nigeria
CITEPA	International Technical Centre on Air Pollution and Climate Change (France - Centre Interprofessione Technique d'Etudes de la Pollution Atmospherique)
CO_2	Carbon Dioxide
CoMAT	Country Methane Abatement Tool
CTF	Common Tabular Formats
DCC	Department of Climate Change
DPR	Department of Petroleum Resources
EF	Emission Factor
ETF	Enhanced Transparency Framework
FMARD	Federal Ministry of Agriculture and Rural Development
FMoE	Federal Ministry of Environment
GACMO	Greenhouse Gas Abatement Cost Model
GHG	Greenhouse Gas
GHG-I	Greenhouse Gas Inventory
GHGMI	Greenhouse Gas Management Institute
IAR&T	Institute of Agricultural Research and Training
ICAT	Initiative for Climate Action Transparency
INDC	Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
LEAP-IBC	Low Emissions Analysis Platform-Integrated Benefits Calculator
LNG	Liquefied Natural Gas
LULUCF	Land Use, Land Use Change and Forestry
MDAs	Ministries, Departments and Agencies
MPG	Modalities, Procedures and Guidelines
MRV	Measurement, Reporting and Verification
NCRI	National Cereal Research Institute
NDC	Nationally Determined Contribution
NEST	Nigerian Environmental Study Action Team
NGC	Nigeria Gas Company

NIHORT	National Institute for Horticultural Research
NNPC	Nigeria National Petroleum Corporation
NOG	Non-Governmental Organization's
O&G	Oil and Gas
OAU	Obafemi Awolowo University
P&M	Policies and Measures
QA	Quality Assurance
QC	Quality Control
SLCFs	Short- Lived Climate Forcers
TNC	Third National Communication
ToR	Terms of Reference

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Executive Summary

The Initiative for Climate Action Transparency (ICAT) Phase II Project represents a significant milestone in Nigeria's efforts to enhance its climate transparency and governance systems. Building on the achievements of Phase I, this phase focuses on operationalizing sectoral Measurement, Reporting, and Verification (MRV) frameworks, expanding institutional capacities, and aligning Nigeria's climate actions with its Nationally Determined Contributions (NDCs) under the Enhanced Transparency Framework (ETF) of the Paris Agreement. The project seeks to position Nigeria as a regional leader in climate transparency and accountability by addressing critical gaps and strengthening the country's climate reporting mechanisms.

The ICAT Phase II inception workshop, held on December 11, 2024, at the Sandralia Hotel in Abuja, marked the official launch of this ambitious phase. The workshop brought together diverse stakeholders, including representatives from government ministries, private sector actors, civil society organizations, development partners, and international consultants. Participants discussed the project's objectives, methodologies, and anticipated outcomes through an open and collaborative forum. The workshop underscored the importance of robust transparency frameworks, emphasizing the need for inclusive participation to ensure Nigeria's climate actions are credible and sustainable.

Building on the successes of Phase I, the project recognizes the foundational work already accomplished in establishing MRV systems for the oil and gas, agriculture and forestry (AFOLU), and transport sectors. These efforts have provided the groundwork for expanding MRV frameworks into additional sectors, particularly the Industrial Processes and Product Use (IPPU) sector, which remains a critical gap in Nigeria's climate transparency architecture. Consultants at the workshop detailed how the project aims to integrate these sectoral MRV systems into a unified national framework, emphasizing the need for standardized guidelines, quality assurance and quality control (QA/QC) protocols, and capacity-building initiatives to enhance data reliability and reporting accuracy.

Enhancing institutional capacities is a core objective of the second phase (Phase II) of the ICAT Nigeria MRV System Setup Project. The National Council on Climate Change Secretariat (NCCC-S), as the central coordinating body and lead National Implementation Entity, plays a pivotal role in operationalizing the MRV framework and ensuring alignment with Nigeria's NDC commitments. To support this, the project includes comprehensive training programs designed to equip NCCC staff and other stakeholders with the tools, methodologies, and skills necessary for effective MRV implementation. These programs focus on the practical application of IPCC guidelines, the requirements of the ETF, and the use of digital tools such as the RISQ platform for data collection and analysis.

Stakeholder engagement emerged as a cornerstone of the project, with a strong emphasis on fostering collaboration among ministries, agencies, private sector entities, and civil society organizations. The workshop highlighted the importance of validating data collection protocols and refining methodologies through stakeholder consultations. By involving these diverse groups, the project seeks to foster a sense of ownership and accountability among all participants, ensuring that the MRV systems are not only technically sound but also widely accepted and utilized.

The project also aligns closely with Nigeria's broader climate strategies, including its Energy Transition Plan (ETP) and NDC commitments. Consultants at the workshop outlined plans to use scenario modelling and policy assessments to evaluate the impact of various measures, such as feed-in tariffs for electricity and renewable energy policies, on emissions reductions. This alignment ensures that the MRV systems developed under ICAT Phase II will directly support Nigeria's ability to track progress and make decisions based upon sound data in order to pursue its climate goals.

By the conclusion of Phase II, Nigeria aims to operationalize a comprehensive and integrated MRV framework that enhances institutional capacities, improves data quality, and strengthens its climate reporting systems. These outcomes are expected to significantly bolster Nigeria's ability to meet its NDC targets, enhance access to international climate finance, and contribute to global efforts to mitigate climate change.

1.0 Introduction

The Initiative for Climate Action Transparency (ICAT) Phase II Project is a cornerstone of Nigeria's strategic efforts to bolster its climate governance and transparency mechanisms. Building on the foundational achievements of ICAT Phase I, this phase seeks to strengthen Nigeria's capacity to develop, operationalize, and sustain Measurement, Reporting, and Verification (MRV) systems. This will be a critical component for meeting its climate commitments under the Paris Agreement. The ICAT Phase II project reflects Nigeria's recognition of the global imperative for enhanced climate transparency and its dedication to implement robust systems for tracking progress toward its Nationally Determined Contributions (NDCs).

The inception workshop, convened on December 11, 2024, at Sandralia Hotel in Abuja, marked the formal commencement of ICAT Phase II. This event brought together a broad spectrum of stakeholders, including representatives from government ministries, technical experts, development partners, civil society organizations, and private sector actors. These participants represented the diverse institutions and organizations essential to the project's success. The workshop provided a platform for critical dialogue and alignment of project objectives, scope, and implementation strategies. It fostered a shared understanding among stakeholders regarding the roles and responsibilities required to operationalize MRV systems that meet both national and international reporting standards. Furthermore, the workshop emphasized the importance of leveraging stakeholder expertise and collaboration to ensure that the project outcomes are sustainable and aligned with Nigeria's development priorities.

Phase II of the ICAT initiative represents more than a technical intervention; it signifies Nigeria's commitment to integrating transparency into its climate governance, ensuring evidence-based decision-making, and aligning national actions with global best practices. The workshop not only set the tone for an inclusive and rigorous implementation process but also underscored Nigeria's readiness to fulfil its climate obligations with accountability and ambition.

1.1 Background

As Africa's largest economy and most populous country, Nigeria stands at a critical juncture in its development trajectory. Nigeria needs to navigate the complexities of rapid economic growth, population expansion, and environmental sustainability in order to meet its climate change objectives. The country faces a dual imperative: to maintain its leadership role in economic progress across the continent while simultaneously transitioning to a low-carbon, climate-resilient economy. This challenge is underscored by Nigeria's status as a major fossil fuel producer, which necessitates deliberate and strategic action to diversify its economy and decouple growth from carbon emissions.

Nigeria's NDC 2.0 commitment to climate action is enshrined in its Updated Nationally Determined Contributions (NDCs), where the country has pledged to reduce its greenhouse gas (GHG) emissions by 20% unconditionally and 47% conditionally by 2030. These targets span critical sectors focused on energy, transport, agriculture, forestry, and industrial processes. This highlights the comprehensive nature of Nigeria's climate strategy. However, the successful realization of these commitments hinges on the establishment of robust and integrated systems for tracking and verifying progress—a task that has been both ambitious and complex given the existing gaps in institutional capacity, data and data quality, and sectoral coordination.

Under ICAT Phase I, Nigeria made significant strides in addressing these challenges. The initiative delivered an Overarching Institutional MRV Framework that provided a structured approach to tracking NDC implementation across key sectors.

The ICAT Phase I project conducted a needs and gap analysis to identify critical weaknesses in Nigeria's MRV systems. It developed sectoral MRV frameworks for the Oil & Gas, Transport, and Agriculture, Forestry, and Other Land Use (AFOLU) sectors. These efforts culminated in the development of tools and indicators to assess the effectiveness of climate policies and measures, enabling Nigeria to make more informed decisions about its climate priorities. Additionally, Phase I introduced key elements of institutional arrangements, laying the groundwork for coordination across government agencies and sectors.

Despite these achievements, gaps remain in sectoral MRV development, particularly in areas such as the Industrial Processes and Other Product Use (IPPU) and Energy sectors. These sectors play pivotal roles in Nigeria's emissions profile and economic landscape. They require further technical and institutional capacity to meet the stringent requirements of the Enhanced Transparency Framework (ETF) under the Paris Agreement. Moreover, while Phase I established a foundation for tracking emissions and climate actions, the scope and depth of MRV systems need to expand to align with Nigeria's evolving climate priorities and reporting obligations.

The ICAT Phase II project is a strategic continuation of these efforts, designed to operationalize and enhance sectoral MRV systems, integrate them into the national MRV framework, and build the capacity of the National Council on Climate Change (NCCC) and other stakeholders to improve these sectoral MRV systems. This phase specifically targets:

1. Operationalizing the National MRV Framework - developing the procedural and technical underpinnings required for a fully functional MRV system.

2. Capacity Building for GHG Inventory Management - equipping the NCCC with tools, methodologies, and training to establish a GHG Inventory Management System (GHGIMS) that meets international standards.

3. Sectoral MRV System Development - expanding MRV coverage to sectors such as IPPU and Energy, ensuring comprehensive and sector-specific tracking of emissions and mitigation actions.

4. Energy Transition Plan (ETP) Support - providing analytical frameworks and technical support to harmonize Nigeria's ETP with its NDCs, including assessing the GHG impacts of specific policies and measures.

5. Stakeholder Engagement and Coordination - ensuring that diverse voices across government, private sector, civil society, and academia are integrated into the MRV system development process, fostering ownership, robust data and analyses, and sustainability.

The challenges to be addressed by ICAT Phase II are significant, but achievable. The project's design reflects a balance between addressing immediate gaps and laying the foundation for long-term sustainability. By aligning international expertise with national priorities, the project aims to strengthen Nigeria's climate governance architecture and position the country as a leader in climate transparency on the African continent.

The inception of ICAT Phase II represents not just a technical milestone but also a reaffirmation of Nigeria's leadership in global climate action. Through this initiative, Nigeria is poised to transform its MRV systems into a model of transparency, accountability, and effectiveness, ensuring that every ton of CO_2e mitigated is accurately measured, reported, and verified.

Figure 1: ***ICAT Nigeria Phase II Sectoral MRV Systems Project Launch/Inception Workshop Participants and Stakeholders***

*Figure 2**: Cross Section of Participants at the ICAT Nigeria MRV System Setup Project Inception Workshop***

*Figure 3**: ICAT Director, NCCC-S DG and ICAT National Consultants and Steering Committee Members***

*Figure 4: **ICAT Director Dr. Henning Wuester (right) and NCCC-S DG Dr. Nkiruka Maduekwe (left) During the Inception Workshop***

1.2 Objectives

1. **Developing Robust MRV Guidelines**: The project will establish comprehensive Measurement, Reporting, and Verification (MRV) guidelines to support the implementation of the national MRV framework. This includes the development of regulatory provisions, data collection templates, guidance documents, manuals, and clearly defined roles and responsibilities. The guidelines will integrate with the national MRV online system and encompass emission inventories and data required to track progress on Nationally Determined Contributions (NDC) implementation. Indicators for reporting on policies and measures will also be developed to facilitate consistent and transparent assessments of climate actions.

2. **Building the NCCC's Capacity for GHG Inventory Management**: The project will deliver tailored capacity-building initiatives to empower the National Council on Climate Change (NCCC) to operationalize a robust Greenhouse Gas Inventory Management System (GHGIMS). These initiatives will include training on ETF requirements, the use of the Intergovernmental Panel on Climate Change (IPCC) software, and UNFCCC reporting tools. Additionally, the project will provide recommendations to enhance the transparency and efficiency of the national data system.

3. **Establishing a Sectoral MRV Framework for IPPU**: The project will focus on developing an MRV framework tailored to the Industrial Processes and Other Product Use (IPPU) sector under the UNFCCC. Activities will include a detailed review of sectoral data flows, QA/QC (quality assurance/quality control) procedures, stakeholder roles, and institutional capacities. Recommendations for institutional

arrangements will be aligned with the overarching national MRV framework to ensure consistency and comprehensiveness.

4. **Supporting Energy Transition Plan (ETP) Implementation**: Recognizing the pivotal role of energy in Nigeria's climate strategy, the project will support efforts to harmonize the Energy Transition Plan (ETP) with the NDC. This involves stocktaking of Phase I achievements, developing GHG emission projections for the energy sector under various scenarios, and assessing the GHG impact of targets outlined in the ETP. Specific focus will be given to evaluating the impact of Feed-in Tariffs (FIT) using ICAT's Renewable Energy Policy Assessment Guide to ensure energy policies are aligned with climate goals.

The Project Inception meeting achieved three main objectives:

The **Inception Workshop** of the Nigeria ICAT Phase II Project was designed to achieve three main objectives as follows:

1. **Raise Awareness**: To enhance understanding and awareness of the Nigeria ICAT Project among national stakeholders, including representatives from government agencies, non-governmental organizations (NGOs), academia, and the private sector.

2. **Clarify Stakeholder Roles and Responsibilities**: To define and align expectations regarding the roles, contributions, and responsibilities of key stakeholders in the successful implementation of the project.

3. **Review and Adopt the Project Work Plan**: To facilitate discussions and secure consensus on the project's detailed work plan, ensuring alignment with national priorities and stakeholder inputs.

Expected Results:

The meeting was expected to deliver the following tangible results:

1. **Enhanced Stakeholder Engagement**: Key authorities and stakeholders across diverse sectors were effectively engaged, informed about the objectives of the Nigeria ICAT Project, and expressed their commitment to supporting its implementation in the country.

2. **Defined Roles and Responsibilities**: Stakeholders' roles, contributions, and responsibilities were clearly delineated, and potential barriers to effective implementation were identified, alongside viable solutions to address them.

3. **Knowledge Sharing on Sectoral MRV Systems**: Participants gained insights into the design and operation of sectoral MRV systems, fostering a shared understanding of the methodologies and tools required to successfully deliver project outcomes.

4. **Adoption of the Project Work Plan**: The project's comprehensive work plan was reviewed, discussed, and formally adopted, providing a clear roadmap for the implementation phase.

1.3 General Scope of the Assignment

The scope of the ICAT Phase II Project spans across key sectors and institutions, ensuring an inclusive and comprehensive approach to climate transparency and governance. This ICAT project will involve stakeholders from the different Ministries, Departments and Agencies (MDAs) at Federal and State levels, public and private sector organizations and enterprises, NGOs, etc. involved in the sectors covered through an inception meeting

to present the process to be carried out during the project and during a final seminar to present the outcomes of the work. Sectoral experts will then be involved during the core of the project through interviews and direct contacts with key experts and information/data sources carried out face-to-face or remotely.

1. **Operationalizing the National MRV Framework**: Building on the work initiated in Phase I, the project will further develop and refine the national MRV framework to meet ETF requirements. This involves creating regulatory frameworks, data flow procedures, roles and responsibilities, and sectoral guidelines for the five IPCC sectors (Energy, Waste, Industrial Processes and Other Product Use, Agriculture, and Land Use, Land-Use Change, and Forestry). Additionally, Memoranda of Understanding (MoUs) and draft regulatory provisions will be proposed to operationalize the process.

2. **Capacity Building for GHG Inventory Management**: The project will conduct targeted training sessions and workshops to enhance the capacity of the NCCC and other stakeholders in compiling GHG inventories and fulfilling ETF obligations. Using real-world data, participants will apply IPCC guidelines and methodologies to national contexts. Training will also include the use of tools such as the IPCC software and RISQ, a national tool that may be extended to other sectors for broader applicability.

3. **Developing the IPPU Sectoral MRV Framework**:

    - **Sectoral System Review**: A comprehensive review will identify stakeholders, data sources, and gaps in the IPPU sector's MRV capacity. This process will include direct consultations with experts and data providers to ensure reliability, completeness, and periodicity of data. The review will serve as the basis for mapping stakeholders, data flows, and necessary tools.

    - **Institutional Framework Development**: Drawing on the gap assessment, the project will design an institutional MRV framework for the IPPU sector. This framework will define coordination mechanisms, data provider roles, QA/QC protocols, and alignment with national objectives. The inclusion of the IPPU sector in overarching institutional arrangements will ensure harmonization across sectors.

4. **Advancing the Energy Transition Plan (ETP)**:

    - **Assessment of Phase I Achievements**: A stocktaking exercise will evaluate the successes and gaps of Phase I to guide ETP integration.

    - **GHG Emission Projections**: Projections will be developed under three scenarios—baseline, with measures, and with additional measures—providing insights into potential pathways for achieving net-zero emissions.

    - **Policy Impact Assessment**: The ICAT Renewable Energy Policy Assessment Guide will be applied to evaluate the GHG impact of Feed-in Tariffs (FIT) and other energy policies. This analysis will provide actionable recommendations for updating Nigeria's NDC.

5. **Stakeholder Engagement and Collaboration**: The project emphasizes collaboration across federal and state-level agencies, private sector actors, NGOs, and civil society. Engagement mechanisms will include face-to-face consultations, remote interviews, and workshops to ensure inclusive participation. Sectoral experts will also be involved in co-developing tools and frameworks to foster national ownership and long-term sustainability.

1.4 Expected Results

The technical support provided to the country is expected to contribute to the following results:

- **Operationalization of a National MRV Framework** - the project will deliver a functioning Measurement, Reporting, and Verification (MRV) system that integrates sectoral MRV frameworks into a cohesive national framework, enabling accurate tracking of Nigeria's climate actions and NDC implementation.

- **Capacity Building and Institutional Strengthening** - it will empower the National Council on Climate Change (NCCC) and other key stakeholders with the skills, tools, and institutional arrangements required to manage a robust national Greenhouse Gas Inventory Management System (GHGIMS) and fulfill reporting obligations under the Enhanced Transparency Framework (ETF).

- **Enhanced Sectoral Systems** - technical support will develop detailed MRV systems for the Industrial Processes and Other Product Use (IPPU) and Energy sectors, ensuring these key sectors are fully aligned with national and international reporting requirements.

- **Support for the Energy Transition Plan (ETP)** - the project will harmonize the ETP with Nigeria's NDCs by providing GHG projections and assessing the impact of specific policies, such as Feed-in Tariffs (FIT), enabling data-driven updates to the NDC.

- **Improved Data Quality and Transparency** - addressing data gaps and enhancing QA/QC procedures, the project will ensure high-quality, transparent, and reliable climate data to support evidence-based decision-making.

- Stakeholder Engagement and Knowledge Sharing - through targeted consultations, workshops, and training, stakeholders will gain a shared understanding of MRV systems and their roles, fostering collaboration and ownership of project outcomes.

2.0 Work Plan: Approach and Methodology

2.1 Approach and Methodology

The following sections of the report present detailed work plan as identified by the sector consultants in achieving this project activity.

2.1.1 Energy Sector

Nigeria's energy and electricity sector is both a vital economic pillar and a significant challenge in the country's development narrative. As Africa's most populous nation and largest economy, Nigeria possesses an abundance of energy resources, ranging from oil and natural gas to renewable energy potentials such as solar, wind, biomass (e.g., forestry and crop residues) and hydropower. However, the sector remains plagued by systemic inefficiencies, infrastructure deficits, and a pressing need for diversification.

Oil and natural gas dominate Nigeria's energy landscape, with the country being Africa's largest oil producer and possessing the ninth-largest proven gas reserves in the world. These resources have historically underpinned the economy, contributing substantially to government revenues and foreign exchange earnings. The Niger Delta region is the epicentre of oil and gas production, supplying crude oil for export and natural gas for domestic and industrial use. Yet, this reliance on fossil fuels has exposed the sector to global price volatility and sustainability

concerns, emphasizing the need for a transition toward cleaner energy sources and more efficient extraction, transportation and processing/refining both to reduce GHG emissions as well as ensure improved sustainability in the sector.

Nigeria's renewable energy potential is vast but largely untapped. The northern regions offer excellent solar irradiance, making solar energy a highly viable option for both grid and off-grid solutions. Similarly, the country has substantial hydropower capacity, with significant room for expansion beyond reliance on large-scale dams. Wind energy and biomass resources also remain underutilised, presenting further opportunities for diversification, improved efficiency of production and processing, and resilience in the energy mix.

The electricity sector is marked by persistent challenges that have hindered Nigeria's ability to provide reliable power to its citizens. Despite an installed generation capacity of approximately 13,000 megawatts (MW), only about 4,500 MW is consistently available due to inefficiencies and operational challenges. Natural gas accounts for over 70% of electricity generation, complemented by hydropower. However, Nigeria's electricity transmission and distribution infrastructure are ageing and inadequate, leading to frequent outages and technical losses. The Transmission Company of Nigeria (TCN) manages the national grid, but bottlenecks and capacity constraints often limit electricity delivery. Distribution is handled by private companies, which face issues such as poor metering, high non-technical losses, and insufficient infrastructure investment.

Access to electricity remains a significant issue, with over 85 million Nigerians lacking connection to the national grid. This makes Nigeria one of the most electricity-deprived countries globally, with rural areas particularly underserved. The reliance on expensive and polluting diesel generators to, fill these gaps, highlights the urgency of achieving universal energy access through sustainable means.

Policy reforms have aimed to address these challenges. The Electric Power Sector Reform Act (EPSRA) of 2005 unbundled the state-owned monopoly, introducing private sector participation in generation, transmission, and distribution. More recently, Nigeria's Energy Transition Plan (ETP) outlines an ambitious pathway to net-zero emissions by 2060, focusing on renewable energy expansion, energy efficiency improvements, and transitioning from fossil fuels to cleaner, more efficient and renewable alternatives. Incentives such as Feed-in Tariffs (FIT) and initiatives led by the Rural Electrification Agency (REA) aim to promote off-grid and decentralized energy solutions.

Despite the challenges, Nigeria's energy sector offers immense opportunities for growth and transformation. The renewable energy market, particularly solar and wind, presents significant investment potential to meet both grid-connected and off-grid demands. Natural gas, as a relatively cleaner fossil fuel, can serve as a transitional energy source for power generation and export, particularly through liquefied natural gas (LNG) projects. Additionally, improving energy efficiency across transmission, distribution, and consumption can reduce losses and enhance the reliability of supply.

The energy sector also holds the promise of job creation and considerable economic diversification. The transition to renewable energy and the electrification of transport and industry have the potential to generate thousands of jobs in areas such as solar installation, operations and maintenance, battery storage, and electric vehicle manufacturing. These opportunities align with Nigeria's broader development goals of reducing energy poverty, fostering economic growth, and achieving climate resilience.

Scope of Activity

As the Energy & MRV Guidelines Consultant and Project Lead, the responsibility encompasses designing and implementing robust Measurement, Reporting, and Verification (MRV) systems for the energy and transport sectors. This work is central to aligning Nigeria's national MRV framework with its international obligations under

the Enhanced Transparency Framework (ETF) of the Paris Agreement. The consultant's leadership role includes developing comprehensive guidelines, supporting the Energy Transition Plan (ETP), and coordinating with sectoral experts to ensure seamless integration of outputs into the overarching framework. The ultimate objective is to enhance Nigeria's capacity to measure, report, and verify emissions and mitigation efforts while driving progress toward its Nationally Determined Contributions (NDCs).

Stakeholder Engagement and Alignment

A core aspect of this role is fostering meaningful engagement with a diverse group of stakeholders, including government agencies, private sector entities, non-governmental organizations, and development partners. Stakeholder engagement begins with a detailed mapping exercise to identify all relevant entities and their roles in the energy and transport sectors. Establishing trust and aligning objectives are critical, requiring structured dialogues and collaborative workshops. These sessions not only build consensus but also facilitate the co-creation of actionable solutions tailored to the local context.

Workshops are designed to introduce MRV concepts, clarify stakeholder responsibilities, and discuss data-sharing mechanisms. The engagement process also focuses on building partnerships via Memoranda of Understanding (MoUs) between various key stakeholders, which formalize contributions, ensure accountability, and create pathways for sustained collaboration. Additionally, capacity-building sessions are embedded into the engagement strategy to enhance the technical understanding of stakeholders and empower them to actively participate in the MRV system's operationalization.

MRV Framework Development

Developing the MRV framework for the energy sector requires a detailed, methodical approach rooted in both technical expertise and practical application. The work begins with a comprehensive review of the existing frameworks from Phase I of the ICAT Project to assess gaps and areas for enhancement. This review informs the development of sector-specific guidelines, which encompass data collection protocols, reporting formats, and quality assurance/quality control (QA/QC) processes.

A key component of this development involves harmonizing sectoral guidelines with the overarching national MRV framework to ensure consistency, coherence, and increased effectiveness and efficiency. The guidelines are informed by global best practices, including the IPCC 2006 Guidelines for National GHG Inventories, and are tailored to Nigeria's specific institutional and regulatory context. Digital integration is prioritized, leveraging advanced tools for data processing and visualization. Existing tools, such as the RISQ platform, are evaluated and expanded to enhance their applicability to the energy and transport sectors.

Scenario Analysis and GHG Projections

The development of GHG emission projections is a cornerstone of the Energy Transition Plan and is essential for tracking progress toward NDC targets. This work involves customizing the Long-range Energy Alternatives Planning (LEAP) model to reflect Nigeria's unique energy profile, including its reliance on gas as a transitional fuel and its growing focus on renewables. The model is used to generate detailed projections under three scenarios: baseline (business-as-usual), with measures (existing policies), and with additional measures (enhanced mitigation strategies).

Each scenario is underpinned by rigorous data collection and analysis, ensuring transparency and credibility. The projections provide insights into emissions trajectories and help identify opportunities for impactful policy interventions and improved efficiency. The analysis also highlights the potential for emissions reductions

through targeted actions, such as improving energy efficiency, expanding renewable energy capacity, and electrifying transport systems.

Policy Assessment and Impact Evaluation

Evaluating the effectiveness of energy policies is a critical aspect of this role, particularly regarding policies designed to accelerate the adoption of renewable energy. The ICAT Renewable Energy Policy Assessment Guide is employed to measure the impact of Feed-in Tariffs (FIT) and other policy instruments. This evaluation involves a detailed analysis of policy design, implementation, and outcomes, focusing on their contribution to emissions reductions and alignment with national goals.

The assessment extends to identifying regulatory gaps and proposing enhancements to optimize policy effectiveness. Recommendations are formulated to align Nigeria's energy policies with global best practices, ensuring that the country's strategies are both ambitious and achievable. This work also informs updates to the NDC, ensuring that Nigeria's commitments reflect the latest policy impacts and technological advancements.

Deliverables

The work culminates in the delivery of several key outputs. These include detailed MRV guidelines for the energy and transport sectors, a comprehensive GHG emission projections report, and a policy impact assessment report. The consultant also plays a central role in knowledge sharing, contributing to workshops and training sessions that disseminate findings and build stakeholder capacity. The final deliverable is a presentation of key achievements and lessons learned, which provides a roadmap for scaling the MRV framework to other sectors and ensuring its sustainability.

My approach to this work emphasizes a balance between technical rigor and practical application. I would prioritize fostering institutional ownership by ensuring that all guidelines and systems are co-developed with Nigerian institutions (to ensure buy-in and ownership), creating a sense of responsibility and commitment among stakeholders. My approach would also leverage innovative technologies, such as AI-driven analytics for data processing and blockchain for transparency in emissions tracking, to enhance the MRV framework's efficiency and reliability. Also, I would adopt a forward-looking perspective, designing systems that are scalable and adaptable to future expansions into additional sectors or regions.

2.1.2 The Industrial Processes and Other Products Use (IPPU) Sector

The Industrial Processes and Other Products Use (IPPU) sector in Nigeria plays a crucial role in the nation's economic development. This sector encompasses a broad range of industrial activities that include cement production, chemical manufacturing, metals processing, and the use of various products such as refrigerants, aerosols, and solvents. These processes contribute significantly to the generation of carbon dioxide, methane, nitrous oxide, and fluorinated gases. Despite its importance to economic growth and infrastructure development, the sector faces significant challenges in tracking and reporting its emissions comprehensively.

The IPPU sector is a cornerstone of Nigeria's industrial economy, contributing substantially to gross domestic product and employment. Industries such as cement manufacturing are critical to infrastructure development, while chemical production supports agriculture, energy, and healthcare. However, the sector's environmental footprint is significant. For example, clinker production in cement manufacturing emits carbon dioxide during the calcination of limestone, while the use of refrigerants in air conditioning and refrigeration systems releases

potent fluorinated gases. These emissions are often underrepresented in national GHG inventories due to data gaps leading to inconsistent reporting practices.

A critical challenge for the IPPU sector lies in the fragmentation of data collection and reporting systems. Many industries lack standardized methodologies for tracking emissions, leading to incomplete or unreliable datasets. In addition, weak or non-existent quality assurance and quality control (QA/QC) mechanisms undermine the reliability of the information collected. Capacity constraints are also a significant barrier, as many stakeholders, including government agencies and private industries, lack the technical expertise and resources needed to implement robust Measurement, Reporting, and Verification (MRV) systems. Institutional gaps further complicate the situation, with unclear roles and responsibilities for data collection and reporting resulting in inefficiencies and overlaps. The absence of a specific regulatory framework for emissions reporting in the IPPU sector exacerbates these challenges, creating compliance gaps and limiting the ability to enforce accurate and timely reporting.

Developing and implementing a robust MRV framework for the IPPU sector presents an opportunity to address these challenges and deliver substantial value to the efforts of the Federal Government of Nigeria to decarbonize the economy and achieve net-zero emissions by 2060. Strengthened reporting protocol will enhance the accuracy, completeness, and transparency of Nigeria's national GHG inventory, ensuring that emissions from the IPPU sector are properly captured. This improvement will enable Nigeria to meet its obligations under the Enhanced Transparency Framework of the Paris Agreement. Reliable emissions data will also support evidence-based policymaking, enabling the government to design targeted measures to such as promoting energy efficiency, optimizing industrial processes, and adopting low-carbon technologies to reduce GHG emissions.

Enhanced reporting mechanisms will demonstrate Nigeria's commitment to global climate goals, bolstering its credibility in international climate negotiations and facilitating access to climate finance mechanisms. A robust MRV framework will also encourage private sector engagement by providing clear guidelines and incentives for emissions reductions. Additionally, this will provide the Industrial sector with a roadmap that will facilitate identification of Environment, Social and Governance (ESG) best practices, operational costs reduction, and improved competitiveness.

Enhanced transparency will position Nigerian industries to meet international sustainability standards, improving market access and fostering long-term growth via new pathways to products innovation and international climate investment opportunities, particularly for industries that can demonstrate strong ESG commitments and robust GHG emissions management practices.

Strengthened reporting in the IPPU sector will also play a critical role in supporting Nigeria's Energy Transition Plan (ETP) and facilitate better integration of the IPPU sectoral activities into Nigeria's broader just transition framework aligned to national and international climate targets. The process of developing and operationalizing the MRV framework will include capacity-building initiatives, equipping stakeholders with the skills needed to sustain and enhance GHG data reporting systems over time. This effort will foster collaboration between government agencies, industries, and development partners, creating a cohesive approach to climate action.

Moreover, robust industrial GHG emissions data reporting will drive economic opportunities and innovation within the sector. Highlighting emissions hotspots and inefficiencies will encourage industries to adopt cleaner technologies and processes, potentially unlocking new revenue streams and attracting green investments.

From the foregoing, it is evident that this ICAT work designed to strengthen MRV in the IPPU sector is a mere technical exercise and a strategic initiative with far-reaching implications for the IPPU sector in particular, and Nigeria in general. By institutionalising best practices and addressing existing gaps, Nigeria can create an African

model for industrial transparency and sustainability. This effort will enhance the nation's capacity to report accurately and consistently, support the transition to a low-carbon economy, and position Nigeria as a leader in climate action on the global stage. Through these advancements, the IPPU sector will contribute to Nigeria's development goals and the broader objectives of environmental stewardship and economic resilience on the journey to the 2060 net-zero emissions economy destination.

Scope of Activities

The IPPU sector encompasses various industrial activities, including chemical production, cement manufacturing, metal processing, and the use of products such as solvents and refrigerants. These processes often generate significant greenhouse gas (GHG) emissions, including carbon dioxide, methane, nitrous oxide, and fluorinated gases. As an IPPU Sector Expert with decades of experience, my primary responsibility is to develop a robust and comprehensive MRV framework that captures the complexities of this sector while ensuring alignment with Nigeria's overarching national MRV framework and international standards.

The work requires a detailed understanding of industrial processes, stakeholder engagement, data collection methodologies, and quality assurance/quality control (QA/QC) mechanisms. By addressing existing gaps and institutionalizing best practices, the MRV framework will enable Nigeria to accurately report IPPU emissions and mitigation measures, thereby fulfilling its commitments under the Enhanced Transparency Framework (ETF) of the Paris Agreement.

Detailed Approach

Comprehensive Needs Assessment

The first step in developing a robust MRV framework for the IPPU sector is to conduct a thorough needs assessment. This involves an exhaustive review of existing documentation, data systems, and institutional arrangements. The assessment will map the entire landscape of the IPPU sector, including identifying key industrial activities, stakeholders, data sources, and current data collection, reporting, and verification gaps.

As part of the needs assessment, the IPPU Consultant will:

- Engage directly with industrial stakeholders, including large-scale manufacturers, trade associations, and regulatory agencies, to understand their operations and data management practices.
- Evaluate existing datasets to identify inconsistencies, incomplete records, or outdated methodologies.
- Analyze Nigeria's current regulatory and institutional framework to pinpoint gaps in mandates, roles, and responsibilities.
- Highlight specific challenges in data reliability, such as QA/QC weaknesses, lack of capacity among stakeholders, and barriers to real-time data access.

The outcome of this needs assessment will be a detailed diagnostic report that outlines the current state of the IPPU sector and provides actionable recommendations for addressing identified gaps.

Designing a Sectoral MRV Framework

Developing the MRV framework requires creating a structured, scalable, and transparent system tailored to the unique characteristics of the IPPU sector. The framework must align with international standards, such as the

IPCC 2006 Guidelines for National Greenhouse Gas Inventories while being adaptable to Nigeria's specific industrial and regulatory context.

The framework design process will include:

- **Institutional Arrangements**: Clearly defining roles and responsibilities among stakeholders, including industrial operators, government agencies, and data providers. Coordination mechanisms will be established to ensure seamless data flow and compliance with reporting requirements.

- **Data Collection Protocols**: Developing standardized templates for data collection that capture emissions from diverse IPPU processes. The protocols will specify the frequency of reporting, parameters to be monitored, and acceptable methodologies for estimating emissions.

- **QA/QC Procedures**: Implementing rigorous Quality Assurance (QA)/Quality Control (QC) protocols to ensure the accuracy, completeness, and reliability of data. This includes training stakeholders on QA/QC practices, establishing independent verification mechanisms, and conducting regular audits.

- **Digital Integration**: Leveraging digital tools and platforms to automate data collection and processing, enhance real-time monitoring, and reduce the risk of human error.

The MRV framework will also incorporate mechanisms for periodic review and updates to accommodate advancements in technology, changes in industrial practices, or new regulatory requirements.

Integration into the National MRV Framework

Ensuring seamless integration of the IPPU MRV system into Nigeria's overarching national MRV framework is essential for consistency and coherence. This will involve:

- Aligning IPPU data collection and reporting protocols with the broader national MRV system, including the GHG Inventory Management System (GHGIMS).

- Establishing data-sharing agreements and interoperability standards to facilitate the smooth exchange of information between the IPPU sector and the national framework.

- Developing indicators for tracking mitigation actions within the IPPU sector and harmonizing these with national NDC reporting formats.

Collaboration with other sectoral experts, particularly in energy and agriculture, is crucial to achieving effective integration. The MRV framework must account for cross-sectoral interactions, such as using energy in industrial processes or the impact of land-use changes on raw material availability.

Deliverables

The deliverables from this work will reflect the depth of the analysis and the practicality of the solutions proposed:

1. **IPPU Sectoral MRV Guidelines:** A comprehensive set of guidelines outlining data collection, reporting methodologies and QA/QC procedures specific to the IPPU sector. These guidelines will serve as a

reference document for stakeholders and provide clear instructions for implementing the MRV framework.

2. **Report on Institutional Arrangements and QA/QC Protocols:** This detailed report presents the institutional arrangements required to operationalize the MRV system. It includes recommendations for stakeholder roles, data flow processes, and capacity-building initiatives. The report will also include a QA/QC protocol tailored to the IPPU sector, addressing key challenges identified during the needs assessment.

3. **Recommendations for Integration into the National Framework** Practical recommendations for incorporating IPPU data and processes into the national MRV framework. This deliverable will include a roadmap for implementation, highlighting milestones, resource requirements, and potential risks.

2.1.3 Agriculture Sector

Summary of Agriculture Sector Approach

The agriculture sector in Nigeria is a vital component of the economy, providing food security, employment, and livelihoods for millions, particularly in rural areas. At the same time, it is a significant source of greenhouse gas (GHG) emissions, contributing to climate change. Emissions arise primarily from livestock, crop production, soil management, and the burning of agricultural residues, with livestock alone accounting for a substantial share of methane emissions through enteric fermentation and manure management. Rice cultivation, fertilizer application, and other soil management practices contribute further, releasing methane and nitrous oxide into the atmosphere. Addressing these emissions requires a robust Measurement, Reporting, and Verification (MRV) framework that aligns with international standards, particularly the guidelines set by the Intergovernmental Panel on Climate Change (IPCC).

To develop this framework, it is essential to account for Nigeria's unique agricultural practices and regional variations. This involves tailoring methodologies for data collection and emissions estimation to the country's specific contexts while ensuring compliance with IPCC requirements. Standardized methods will be established to measure emissions from key sub-sectors such as livestock and crop production. For instance, methane emissions from enteric fermentation will be calculated using Tier 2 IPCC methods, which incorporate regional-specific feeding regimes and livestock management practices, providing more accurate results than generic Tier 1 approaches. Activity data, such as livestock numbers, fertilizer application rates, and irrigation practices, will be systematically collected using carefully designed templates. Where country-specific emission factors are unavailable, IPCC default values will be used, adapted to reflect Nigeria's conditions.

The MRV framework will also integrate rigorous quality assurance and quality control (QA/QC) protocols to ensure data reliability and accuracy. These protocols will involve periodic audits, cross-verification of field data with remote sensing outputs, and training for stakeholders in maintaining high data standards. Additionally, the framework will harmonize agricultural data with Nigeria's overarching GHG Inventory Management System (GHGIMS), facilitating seamless integration into national reporting structures.

Stakeholder engagement and capacity building are critical to the success of the MRV framework. A comprehensive mapping of stakeholders, including government agencies, local governments, farmer cooperatives, research institutions, and private sector actors, will help identify key players and define their roles within the framework. Regular workshops and consultations will foster alignment with MRV objectives and processes, ensuring a shared commitment to accurate emissions reporting. Tailored training programs will equip

stakeholders with the technical knowledge needed to implement the framework effectively. This includes hands-on sessions on data collection methodologies, emissions estimation techniques, and the application of tools such as the IPCC Agriculture Inventory Tool and GIS platforms for spatial analysis. Practical, scenario-based training will further strengthen stakeholders' ability to collect and validate field data, implement QA/QC protocols, and analyze results.

Technological integration will play a pivotal role in enhancing data collection and analysis efficiency and accuracy. Remote sensing and GIS technologies will be deployed to monitor land-use changes, crop patterns, and irrigation practices. Mobile-based applications will facilitate data collection at the farm level, enabling real-time reporting and validation. These digital tools will be seamlessly integrated into the GHGIMS, creating a dynamic system capable of adapting to changing agricultural practices and data requirements.

The deliverables from this work will include a comprehensive agriculture sectoral MRV guideline document that provides clear instructions on methodologies, data collection processes, and QA/QC protocols. Capacity-building efforts will be documented through detailed reports of workshops, highlighting participant feedback, learning outcomes, and recommendations for ongoing training. Additionally, customized templates and digital tools for emissions data collection will be developed and made accessible to all relevant stakeholders. Finally, the results of this effort will be reflected in comprehensive GHG inventory reports detailing emissions from livestock, croplands, and soil management and integrated into Nigeria's national inventory system.

2.1.4 Land-Use, Land-Use Change and Forestry (LULUCF) Sector

Nigeria's Land Use, Land-Use Change, and Forestry (LULUCF) sector represents a critical frontier in the nation's efforts to address climate change and achieve sustainable development. As a country with a rapidly growing population and expanding urban centers, Nigeria faces escalating pressures on its natural resources. The LULUCF sector, encompassing forests, agricultural lands, wetlands, grasslands, and settlements, serves as both a significant source of greenhouse gas (GHG) emissions and a potential carbon sink. The interplay of urbanization, population growth, and economic activities within this sector has far-reaching implications for the country's environmental health and its ability to meet international climate commitments. According to Nigeria's updated Nationally Determined Contribution (NDC) submitted in 2021, the country reported LULUCF emissions of approximately 100 million tonnes of CO_2 equivalent ($MtCO_2e$) in 2018. Projections indicate that, under a business-as-usual scenario, emissions from the Agriculture, Forestry, and Other Land Use (AFOLU) sector could rise to about 473 $MtCO_2e$ by 2030.[1]

Rapid urbanization and population growth are key drivers of land-use change in Nigeria. With an estimated population of over 220 million and an annual growth rate exceeding 2.5%, the demand for housing, infrastructure, and agricultural land has surged. Urban expansion into peri-urban and rural areas has led to widespread conversion of forested and agricultural lands into settlements and industrial zones. This trend is exacerbated by inadequate urban planning, resulting in uncontrolled sprawl and significant environmental degradation.

Deforestation is one of the most visible and impactful consequences of land-use change in Nigeria. The country's forests, once vast and diverse, are being depleted at an alarming rate. Nigeria reportedly has one of the highest deforestation rates in the world, losing an estimated 350,000 to 400,000 hectares annually. Forest reserves, once protected as biodiversity hotspots and carbon sinks, are increasingly converted for agriculture, logging, and infrastructure development. The conversion of forests into farmlands and settlements contributes not only to

[1] https://climateactiontracker.org/countries/nigeria/targets/

GHG emissions but also to the loss of ecosystem services such as water regulation, soil fertility, and biodiversity conservation.

The depletion of forests and other natural resources has cascading effects on land quality. Land degradation is a pressing issue in Nigeria, with over 35% of the country's land area affected by desertification, soil erosion, and nutrient depletion. In the northern regions, where arid and semi-arid conditions prevail, overgrazing and unsustainable agricultural practices exacerbate desertification, threatening livelihoods and food security. In southern Nigeria, deforestation and poor land management contribute to severe soil erosion, reducing agricultural productivity and increasing vulnerability to flooding.

Wetlands, which provide critical ecosystem services such as water filtration, flood regulation, and habitat for aquatic species, are also under threat. The conversion of wetlands for agriculture, urban expansion, and industrial activities has significantly reduced their extent and functionality. For example, the Niger Delta, one of the world's largest wetland ecosystems, has experienced substantial degradation due to oil exploration, pollution, and unregulated land-use changes. Wetland loss contributes to increased GHG emissions, reduced biodiversity, and heightened flood risks for nearby communities.

The challenges within Nigeria's LULUCF sector are compounded by weak institutional capacity and data gaps. Accurate monitoring, reporting, and verification (MRV) of emissions and removals from land-use activities remain hindered by inadequate data collection systems, limited technological adoption, and fragmented institutional coordination. Structural issues within Nigeria's data management ecosystem have hindered the development of a robust national MRV system for the LULUCF sector.[2] These shortcomings impede the country's ability to effectively track progress toward its Nationally Determined Contributions (NDCs) and comply with the Enhanced Transparency Framework (ETF) under the Paris Agreement.

To address these challenges, Nigeria has been working on designing and integrating new institutional arrangements into its broader National MRV System. This includes developing sectoral frameworks and guidelines to enhance data collection, processing, and reporting in the LULUCF sector. Such efforts are crucial for accurately tracking progress toward NDC commitments and ensuring transparency in climate action reporting.

Despite these challenges, the LULUCF sector holds significant potential for mitigation and adaptation. Forests and other land-use systems can act as carbon sinks, offsetting emissions from other sectors. Sustainable land management practices, reforestation programs, and conservation initiatives offer pathways to reduce emissions, enhance resilience, and improve livelihoods. Nigeria's Energy Transition Plan and climate strategies recognize the importance of leveraging the LULUCF sector to achieve net-zero emissions by 2060. Initiatives such as the Reducing Emissions from Deforestation and Forest Degradation (REDD+) program and the adoption of agroforestry systems are steps in the right direction.

the LULUCF sector is integral to Nigeria's climate change mitigation strategy. Strengthening data management and MRV systems within this sector is essential for achieving the country's emission reduction targets and fulfilling international reporting obligations.

Overall Sectoral Approach and Methodology

The Forestry, Land Use, and Land-Use Change (LULUCF) sector is a critical component of Nigeria's greenhouse gas (GHG) inventory, representing both a source of emissions and a sink for carbon sequestration. Forests,

[2] https://climateactiontransparency.org/wp-content/uploads/2022/02/Output-H_LULUCF-Sectoral-Framework.pdf

grasslands, wetlands, and agricultural lands in Nigeria play an integral role in carbon cycling, biodiversity preservation, and providing livelihoods for millions. However, activities such as deforestation, land degradation, and agricultural expansion contribute significantly to GHG emissions, necessitating robust mechanisms for tracking and reporting emissions and removals in this sector. Developing an effective MRV (Measurement, Reporting, and Verification) system for LULUCF is essential to meet Nigeria's obligations under the Enhanced Transparency Framework (ETF) of the Paris Agreement and to support the country's Nationally Determined Contributions (NDCs).

As a seasoned expert with decades of experience in implementing IPCC guidelines, I will adopt a methodical and comprehensive approach to integrating LULUCF data into Nigeria's national MRV framework. This will involve establishing a detailed sectoral inventory guide, streamlining institutional coordination, developing capacity among stakeholders, and creating a sustainable data collection and reporting system.

Data Integration and Sectoral Inventory Guide

The cornerstone of an effective MRV framework for the LULUCF sector lies in the integration of accurate, reliable, and consistent data into the national greenhouse gas inventory. To achieve this, I will develop a comprehensive sectoral inventory guide tailored to Nigeria's unique land-use categories and institutional context. This guide will align with the IPCC 2006 Guidelines for National Greenhouse Gas Inventories and the 2019 Refinement to ensure compliance with international standards.

The inventory guide will provide a step-by-step methodology for data collection and processing, including:

- **Emissions and Removal Categories**: Clear delineation of emission sources and carbon sinks, such as forest biomass, soil organic carbon, harvested wood products, and non-CO_2 emissions from agriculture.
- **Activity Data Collection**: Guidance on collecting and validating activity data for key categories, including deforestation rates, afforestation efforts, land-use conversions, and sustainable land management practices.
- **Emission Factors**: Identification of country-specific emission factors where available and recommendations for applying default IPCC factors in their absence.
- **Data Archiving and Access**: Establishing protocols for data storage, accessibility, and retrieval to support transparency and long-term data integrity.
- **Quality Assurance/Quality Control (QA/QC)**: Procedures to ensure data accuracy, including cross-referencing with remote sensing data, validation of field measurements, and periodic audits of data collection processes.

This guide will be designed as a dynamic document, allowing for updates as new methodologies, technologies, or policies emerge. It will also include templates for data collection, reporting formats, and clear instructions for integrating sectoral data into the national GHG Inventory Management System (GHGIMS).

Capacity Building and Stakeholder Support

Given the complexity and cross-sectoral nature of the LULUCF sector, capacity building and stakeholder engagement are critical components of the approach. The MRV system's success hinges on the ability of stakeholders from government agencies to local communities to collect, validate, and report data effectively.

Stakeholder Mapping and Engagement

The process begins with a detailed mapping of stakeholders involved in the LULUCF sector, including forestry departments, agricultural agencies, local governments, academic institutions, non-governmental organizations, and community leaders. A clear understanding of each stakeholder's role, responsibilities, and data-handling capacity will guide engagement strategies. Workshops and consultations will be organized to build consensus on the objectives, methodologies, and institutional arrangements for MRV.

Capacity Building Initiatives

Capacity-building efforts will focus on equipping stakeholders with the technical knowledge and tools required to implement the sectoral inventory guide and sustain the MRV system. Training modules will be developed to cover:

i. **Understanding the IPCC Guidelines**: Detailed training on methodologies for estimating emissions and removals, tailored to Nigeria's land-use categories.

ii. **Data Collection and Validation**: Practical sessions on using the templates provided in the inventory guide, collecting field data, and validating activity data through GIS and remote sensing tools.

iii. **QA/QC Procedures**: Workshops on implementing the QA/QC protocols outlined in the inventory guide, ensuring consistency and reliability in data reporting.

iv. **Use of Technology**: Training on leveraging digital tools such as satellite imagery, GIS platforms, and data analytics software for real-time monitoring and reporting.

Institutional Strengthening

Strengthening institutional arrangements is integral to harmonising data flows and ensuring accountability. Formalised data-sharing agreements and clearly defined roles will eliminate redundancies and foster collaboration between forestry, agricultural, and environmental agencies. A central repository for land-use data will be established within the GHGIMS, ensuring that all data is accessible, traceable, and securely archived.

The inventory guide will act as a unifying document, standardizing practices across institutions and enabling seamless integration of LULUCF data into the national framework. Regular coordination meetings will align priorities, resolve challenges, and assess progress in implementing the MRV system.

Deliverables

The deliverables from this work will reflect the depth of the approach and the transformative impact of the MRV framework:

1. **Sectoral Inventory Guide for LULUCF** a comprehensive, user-friendly guide detailing methodology for emissions estimation, QA/QC protocols, and integration processes. The guide will serve as a reference for stakeholders and a cornerstone for sustaining the MRV framework.

2. **LULUCF-Specific Data Templates** - standardized templates tailored to Nigeria's land-use categories, facilitating consistent and transparent data collection and reporting.

3. **Stakeholder Training Reports** - documentation of capacity-building sessions, including participant feedback, learning outcomes, and recommendations for future training.

4. **Institutional Coordination Mechanisms**—A report outlining institutional arrangements, data-sharing agreements, and operational workflows that ensure the MRV system's efficiency and sustainability.

As a seasoned professional with decades of experience in LULUCF and IPCC requirements, my approach to this work is underpinned by a commitment to building resilient systems and fostering local ownership. The sectoral inventory guide will serve as a technical document and strategic tool for capacity building and institutional alignment.

2.1.5 GHG Inventory Management System

The development and operationalization of Nigeria's Greenhouse Gas Inventory Management System (GHGIMS) is a critical component of the ICAT Phase II project. This work will strengthen the National Council on Climate Change (NCCC)'s capacity to accurately measure, report, and verify GHG emissions across sectors in alignment with Enhanced Transparency Framework (ETF) obligations under the Paris Agreement. The approach combines capacity building, technical system design, and integration of advanced methodologies to ensure that the GHGIMS is robust, user-friendly, and sustainable.

Comprehensive Capacity Building

The cornerstone of this effort is empowering the NCCC team and key stakeholders with the knowledge and skills necessary to manage the GHG inventory independently. This involves a phased and hands-on capacity-building program tailored to address Nigeria's specific needs and challenges.

The capacity-building strategy will include an initial assessment to identify knowledge gaps and training needs among stakeholders. Subsequently, two comprehensive training sessions will be conducted. These sessions will cover ETF requirements, the application of IPCC guidelines, and the use of tools such as the IPCC software, UNFCCC reporting tools, and Nigeria's RISQ tool. Real-world data and scenarios will be incorporated to ensure participants can apply theoretical knowledge to practical tasks. The training will also emphasize the Minimum Transparency Guidelines from Decision 18/CMA.1 and Decision 5/CMA.3 to ensure compliance with international reporting standards.

Workshops will bring together NCCC staff and representatives from key energy, agriculture, and IPPU sectors to foster cross-sectoral collaboration and understanding. These sessions will focus on data collection

methodologies, quality assurance/quality control (QA/QC) procedures and sector-specific inventory compilation techniques.

Development and Operationalization of the GHGIMS

The GHGIMS will be developed as a centralized system that integrates data flows from all relevant sectors, ensuring that emissions data is consistent, accurate, and accessible. The system will be built on a modular framework, enabling scalability and adaptability to future reporting requirements.

System Design

The system design will incorporate:

1. A user-friendly interface for data input and retrieval, allowing stakeholders to input sectoral data with minimal technical expertise.

2. Automated tools for data validation and QA/QC, reducing the risk of human error and enhancing data reliability.

3. Interoperability with existing national and international systems, ensuring seamless data exchange and alignment with global reporting standards.

Data Collection Templates and Tools

Templates will be developed for collecting activity data and emission factors across all IPCC sectors, ensuring standardization. These tools will simplify the process of collecting and organizing data from diverse sources, such as industrial facilities, agricultural sites, and energy providers.

Incorporation of Advanced Technologies

Technologies such as remote sensing and GIS will be leveraged to monitor land-use changes and emissions hotspots. The system will also integrate machine learning algorithms to analyze trends and project future emissions scenarios, enhancing the decision-making process.

Parallel Integration with Biennial Transparency Reports (BTRs)

The operationalization of the GHGIMS will be synchronized with the preparation of Nigeria's first BTR. This parallel approach ensures that the knowledge and data systems established during the GHGIMS development process contribute directly to the country's compliance with ETF obligations.

Cross-Sectoral Collaboration

Close collaboration with other sectoral experts is essential for the success of the GHGIMS. The GHG Inventory Management Expert will work alongside consultants in sectors such as energy, IPPU, agriculture, and forestry to harmonize data collection and reporting methodologies. Special input will be made toward the development of the IPPU MRV framework to ensure seamless integration of industrial emissions data into the GHGIMS.

Contributions to MRV Guidelines

The GHG Inventory Management Expert will play a vital role in contributing to the overarching MRV guidelines being developed by the Lead Project Consultant. These guidelines will consolidate best practices, regulatory provisions, and standardized methodologies across all sectors, providing a unified framework for emissions tracking and reporting.

Deliverables

The outcomes of this work will include:

1. A fully operational GHGIMS tailored to Nigeria's needs and aligned with international standards.
2. Detailed reports on the capacity-building workshops, including feedback from participants and recommendations for ongoing training.
3. Comprehensive QA/QC protocols embedded within the GHGIMS to ensure data accuracy and reliability.
4. Customized data collection templates and tools for all relevant sectors.
5. Contributions to Nigeria's BTR, showcasing the operational capacity of the GHGIMS in real-world reporting.

3.0 Execution Plan

The execution of the ICAT Phase II Project began with meticulous preparatory activities and engagement strategies to ensure a smooth rollout and alignment with project objectives. The project aims to operationalize Nigeria's Measurement, Reporting, and Verification (MRV) framework, capacitate the National Council on Climate Change (NCCC) with a Greenhouse Gas Inventory Management System (GHGIMS), and support the development of sectoral MRV frameworks, particularly for Industrial Processes and Other Product Use (IPPU). The execution plan is built on a timeline detailed in the project work plan and supported by a robust framework for stakeholder engagement, capacity building, and delivery of milestones.

The project officially commenced with the inception of consultations with national and international experts in August 2024. These early consultations laid the foundation for the structured engagement of key stakeholders, reviewing existing national documents, and preparing essential inception activities. Following the formal release of Contract award letters to the National Consultants in December 2024, Implementation work continued on the Project inception activities, focusing on reviewing baseline documents and tools, and setting the stage for the Inception Workshop.

The inception workshop, held on December 11, 2024, at Sandralia Hotel, Abuja, brought together stakeholders from diverse sectors, including government MDAs, private sector, technical experts, and development partners. The event served as a platform for introducing the project scope, objectives, and expected outcomes while fostering discussions on roles, responsibilities, and collaboration. This engagement was instrumental in obtaining stakeholder buy-in and aligning their contributions to the project's overarching goals. The stakeholders actively engaged project consultants and suggested the best path forward.

Subsequent project activities will follow the detailed timeline outlined in the work plan, with all deliverables and milestones aligned to meet the project's Terms of Reference (TOR). Each activity is structured to ensure the seamless progression of tasks while accommodating any necessary adjustments. The implementation will be overseen by the NCCC, with close collaboration among national and international consultants to maintain quality and adherence to schedules.

Timelines and Key Deliverables

The project is structured into key milestones and deliverables spread across its 14-month timeline, ending in February 2026. Early activities include preparing sectoral guidelines, reviewing institutional arrangements, and capacity-building workshops. For example, sectoral guidelines for the five IPCC sectors and the IPPU sector review report are scheduled for delivery by April 2025. Capacity-building activities, such as workshops and training sessions, are planned throughout 2025, ensuring continuous stakeholder engagement and skill enhancement.

The GHGIMS development, a critical project component, will involve iterative consultations and workshops, ensuring the system's operability by mid-2025. This includes preparing data flow procedures, QA/QC protocols, and integration frameworks. These efforts will culminate in a final workshop in early 2026 to present the project's outcomes and lessons learned.

Coordination and Risk Management

The project is coordinated through a structured governance framework led by the NCCC. The Project Steering Committee, comprising senior staff from relevant units of the NCCC and key stakeholders, meets regularly to

provide strategic guidance and monitor progress. The committee's role is complemented by the Project Facilitator, who oversees day-to-day implementation and ensures alignment with project objectives.

Risk management strategies have been integrated into the execution plan. Potential risks, such as government bureaucratic delays, data quality issues, or stakeholder disengagement, will be mitigated through proactive communication, capacity building, and the use of alternative data sources when needed. Regular updates and consultations with ICAT management ensure that any deviations from the planned schedule are promptly addressed.

The deliverables, reports and workshops are planned to meet the terms of references.

Figure 5: **Adjusted Execution Schedule for the Project Activity**

ICAT Phase 2 Revised Timeline (Dec 2024 - Feb 2026)

			NC#1 Facilitator	NC#2 Energy (inc. Tranport) & Coordinator	NC#3 IPPU	NC#4 Agriculture					NC#5 LULUCF				
			2024	2025											2026
Activity	Output	Description	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
		National experts recruitments															
		Activity 0: Inception phase															
0.1		Inception workshop															
	A	**Report from the inception workshop**															
		Activity 1: Operationalize the national MRV framework under the Paris Agreement Enhanced Transparency Framework (ETF)															
1.1		GHG inventory															
1.2		NDC tracking															
	B	**Sectoral guidelines for the 5 sectors**															
	C	**Procedures including data flow, responsabilities, timeframe**															
		Activity 2: Capacitation of NCCC team with setting up of an operational GHG inventory management system (GHGIMS)															
2.1		Trainings of the team to operationalize the GHGIMS															
	D	**Preparation and presentation of 2 workshops**															
	E	**Capacity building WS reports**															
		Activity 3: Development of the IPPU sectoral MRV framework															
3.1		Sectoral MRV system review for the IPPU sector															
	F	**IPPU sector review report**															
3.2		Sectoral institutional MRV framework development for the IPPU sector															
	G	**Report presenting the sectoral institutional arrangements and recommendation for national reporting system and design**															
3.3		Inclusion of the IPPU sector in the national overarching institutional arrangements															
	H	**Report presenting the inclusion of the IPPU sector overarching institutional arrangements and recommendation for national reporting system and design**															
		Activity 4: Tracking progress in implementing its Energy Transition Plan															
4.1		Work on projections															
	I	**Report on projections**															
4.2		Assessing the GHG impact of the Feed-in tariffs (FIT) applying ICAT method															
	J	**Report on the FIT P&M assessment**															
		Activity 5: Sharing of knowledge and lessons learnt															
5.1		Organization of a final Workshop with stakeholders															
	K	**Report of the final Workshop**															
5.2		Summarize key achievements															
	L	**Report highlighting key achievements and lessons learned**															

4.0 Data Collection Plan

A well-structured and systematic data collection plan is central to the success of the ICAT Phase II project. This plan outlines the procedures for acquiring accurate, reliable, and timely data, ensuring active collaboration among public and private institutions, consultants, and stakeholders. The following sections detail the process, roles, and responsibilities involved in this essential task.

a) Formal Data Request Process

The National Council on Climate Change (NCCC) acts as the central coordinating body for all data collection efforts. The process begins with the issuance of formal letters to relevant public and private institutions. These letters clearly specify the type of data required, such as GHG emissions, energy usage, or industrial activity, and align the request with national and international climate action obligations. They also include precise deadlines to ensure timely submission. Signed by the Director-General of the NCCC, these letters emphasize the official nature and importance of the data request, highlighting its role in supporting Nigeria's climate commitments.

b) Consultant-Led Follow-Up

After the data requests are issued, international consultants, supported by national consultants, take on the critical role of ensuring compliance. They engage directly with focal points within the targeted institutions through emails, calls, and face-to-face meetings, clarifying data requirements and addressing any challenges. Regular reminders are sent to reinforce deadlines, while technical guidance is provided to assist in preparing and submitting data in the required formats. This proactive follow-up ensures smooth communication and helps institutions overcome barriers to timely data provision.

c) Engagement with Key Data Providers

The data collection plan prioritizes engagement with key public and private sector institutions. These include ministries, agencies, corporations, NGOs, and research bodies. Public institutions such as the Federal Ministry of Environment, Energy Commission of Nigeria, the Department of Petroleum Resources, and private sector players like industrial manufacturers and energy companies play a critical role in supplying sector-specific data. NGOs and research organizations involved in forestry, land use, and conservation efforts also contribute valuable insights. Regular interactions ensure these entities understand the significance of their contributions to Nigeria's climate transparency framework.

d) Data Validation and Quality Assurance

Maintaining data integrity and reliability is a fundamental aspect of the collection process. Collected data is cross verified with other credible sources, such as international databases, national statistics, and existing reports. Comprehensive quality assurance and quality control (QA/QC) protocols are applied to identify and correct discrepancies. Additionally, stakeholders review the data during workshops to ensure its accuracy and completeness, creating a collaborative validation process that enhances data credibility.

e) Use of Digital Tools for Data Management

The project employs advanced digital tools to streamline data collection and management. The National RISQ Tool, initially used for energy and waste sectors, is expanded in Phase II to encompass other sectors. Furthermore, the GHG Inventory Management System (GHGIMS) is a centralized platform for real-time data

input, analysis, and archiving. These tools ensure transparency, accessibility, and efficient management of the collected data.

f) Capacity Building for Data Providers

Many institutions face technical challenges in data collection and reporting. To address this, the project organizes training workshops for focal points within data-providing institutions. These sessions provide detailed guidelines and templates to standardize the data submission process. Consultants are available to offer technical support, ensuring institutions can meet the required standards and deadlines effectively.

g) Timelines and Monitoring

The data collection process is governed by a well-defined timeline aligned with the project's milestones. Consultants, in coordination with the NCCC, monitor progress regularly, addressing delays or challenges promptly. This structured approach ensures that all necessary data is collected within the required timeframes.

d) Reporting and Feedback

Once data is collected, validated, and processed, summary reports are prepared and shared with relevant stakeholders. These reports provide clear insights into the collected data and its implications for Nigeria’s climate commitments. Stakeholders are encouraged to provide feedback, which is then incorporated into the data management process, ensuring continuous improvement and refinement of the collection plan.

5.0 Project Coordination Plan

For effective coordination of the project activity, the Project Coordinator and the National Consultants are guided by the terms of reference and work plan. A monthly meeting commenced from the start of the project activity in December comprising the National Coordinator, National Consultants, International Consultants from CITEPA, Experts from GHGMI and the NCCC.

The reporting structure starts with the national consultants, through the lead consultant, to the National Coordinator, who interphases directly with NCCC and the International Consultants. The national consultants also have the opportunity to communicate directly with their counterparts (the International Consultants with CITEPA and GHGI).

The coordination structure includes the National Council on Climate Change (NCCC), the Project Steering Committee, the In-Country Project Facilitator, Project Consultants, and international experts from **CITEPA** and **GHGMI**. Their roles and responsibilities are clearly defined to enable seamless collaboration and efficient project activity execution.

Coordination Framework

1. **National Council on Climate Change Secretariat (NCCC-S):** The NCCC-S, led by the Director-General, oversees the overall coordination of the project. It chairs the Project Steering Committee and ensures alignment with Nigeria's climate change objectives and policies. The NCCC also facilitates high-level engagements with stakeholders, ensures resource allocation, and provides administrative support to project consultants.

2. **Project Steering Committee:** Composed of senior staff from relevant NCCC units and key national stakeholders, the committee provides strategic direction, monitors project progress, and evaluates implementation outcomes. It also identifies synergies among different project components and ensures timely resolution of challenges.

3. **In-country project Facilitator:** As the primary coordinator, managing day-to-day project operations. Supervises the activities of the Project Consultants and ensures adherence to the terms of reference (ToRs). Maintains communication between the NCCC, ICAT Secretariat, international consultants, and stakeholders to ensure alignment of efforts.

4. **Project Consultants:** Five national consultants specializing in energy, IPPU, GHG inventory management, agriculture, and LULUCF sectors provide technical expertise. They report to the Steering Committee through the In-Country Facilitator and deliver outputs defined in the ToRs.

5. **International Experts from CITEPA and GHGMI: CITEPA Experts** provide technical oversight and capacity-building support to national consultants. CITEPA experts assist in designing MRV frameworks, refining methodologies, and facilitating technical workshops for national consultants and stakeholders. **GHGMI Experts**, provide technical guidance on GHG inventory management and ETF compliance, coordinating closely with the NCCC and other stakeholders.

6. **Stakeholder Engagement:** Engagement with MDAs, private sector entities, and NGOs ensures that the project incorporates diverse perspectives and leverages existing capacities. Workshops and consultations are organised to validate project outputs and gather stakeholder input.

*Table 1: **Roles and Responsibilities***

Role	Responsibilities
NCCC-S Director-General	Provides strategic oversight, chairs the Steering Committee, and ensures resource allocation.
Project Steering Committee	Monitors implementation, resolves challenges, ensures stakeholder coordination and evaluates project progress.
In-Country Project Facilitator	Coordinates day-to-day project activities, supervises consultants, and ensures timely delivery of outputs.
Energy Consultant	Develops MRV guidelines for energy and transport, conducts energy sector GHG projections, and assesses FIT impacts.
IPPU Consultant	Conducts needs assessment, develops MRV framework for IPPU sector, and integrates it into national MRV system.
GHG Inventory Management Consultant	Develops and operationalizes GHGIMS, provides capacity building, and ensures data consistency.
Agriculture Consultant	Develops MRV guidelines for the AFOLU sector and integrates agriculture practices into the national MRV framework.
LULUCF Consultant	Tracks land-use changes, develops forestry MRV framework, and ensures alignment with REDD+ and NDCs.
CITEPA and GHGMI Experts	Provide oversight and technical support to national consultants, lead capacity-building activities, and refine MRV methodologies.
Stakeholders (MDAs, NGOs, Private Sector)	Provide data, validate outputs, and support implementation through consultations and workshops.

6.0 Annexes

Annex I: Minutes of Inception Workshop

Dr. Nkiruka Chidia Maduekwe, Director-General, National Council on Climate Change Secretariat (NCCC-S)

Dr. Nkiruka Chidia Maduekwe began her speech by situating the ICAT Phase II project launch within the broader context of Nigeria's climate goals. She highlighted the importance of aligning national climate initiatives with global frameworks like the Paris Agreement while ensuring they support Nigeria's development aspirations. "Climate action is not just an environmental imperative; it is a developmental necessity," she said, emphasizing the interconnectedness of sustainability and economic growth.

Addressing the diverse stakeholders present, Dr. Maduekwe called for collective project ownership. "This is not just a government-led initiative; it is a national endeavour," she stated. She stressed that achieving robust transparency frameworks requires the active participation of government ministries, private sector entities, civil society organizations, and academia. By fostering inclusive engagement, she argued, Nigeria could ensure the credibility and sustainability of its climate efforts.

Dr. Maduekwe also underscored the significance of the Comprehensive Climate Act of 2021 (CCA 2021), urging participants to familiarize themselves with its provisions. "The CCA is the legal backbone of our climate action. Understanding it is key to fulfilling your roles effectively," she noted while distributing copies of the Act to underscore its importance.

In closing, she reaffirmed the NCCC's commitment to transparency and stakeholder engagement, pledging ongoing collaboration with all partners. "We will not only lead but listen and adapt as we navigate this complex but critical journey together," she said, leaving the audience with a sense of shared responsibility and urgency.

Dr. Henning Wuester, Director of ICAT

Dr. Henning Wuester delivered a speech that underscored ICAT's broader mission while emphasizing Nigeria's pivotal role as a model for climate transparency. He opened by acknowledging Nigeria's progress in implementing the Enhanced Transparency Framework (ETF) of the Paris Agreement. "Nigeria has demonstrated leadership and commitment to the principles of transparency, accountability, and inclusivity in climate action," he said.

He explained the significance of the ETF, describing it as the foundation for global climate cooperation. "Transparency is the glue that holds the Paris Agreement together. Without it, trust erodes, and progress falters," he remarked. He commended Nigeria's efforts in developing MRV systems during Phase I, noting that these systems are vital for tracking and reporting on NDC implementation.

Dr. Wuester also spoke about ICAT's tailored approach to supporting countries. "Our role is not to prescribe solutions but to empower nations with the tools and methodologies they need to succeed," he said. He highlighted ICAT's practical contributions, including developing data collection templates, regulatory guidelines, and stakeholder engagement strategies.

In his concluding remarks, Dr. Wuester emphasized the broader implications of Nigeria's success. "What we accomplish here will resonate far beyond Nigeria's borders. It will serve as a blueprint for other nations striving to build robust transparency frameworks," he stated, reaffirming ICAT's commitment to the project's success.

Dr. Bala Bappa, ICAT In-Country Facilitator and Coordinating Consultant

Dr. Bala Bappa delivered a detailed overview of the ICAT Phase II project, grounding his remarks in the achievements of Phase I while charting the path forward. “The foundation we built in Phase I is strong, but there is much more to do to ensure our climate action is effective and transparent,” he began.

He elaborated on the work completed during Phase I, establishing institutional arrangements for monitoring, reporting, and verification (MRV) systems in priority sectors, including oil and gas, agriculture and forestry (AFOLU), and transport. These arrangements, he explained, are essential for ensuring accurate data collection and reporting under Nigeria’s Nationally Determined Contributions (NDCs). “This is the backbone of our commitment to the Paris Agreement,” he said, adding that these systems ensure Nigeria's climate actions are measurable and verifiable.

Turning to Phase II, Dr. Bappa focused on completing institutional arrangements in the Industrial Processes and Product Use (IPPU) sector. “The IPPU sector has long been a gap in our framework, and this phase is our opportunity to address it comprehensively,” he remarked. He also highlighted the importance of stakeholder mapping to identify roles and responsibilities and capacity-building initiatives to empower those tasked with implementing the MRV system.

He provided a glimpse into the future, emphasizing the operationalization of the Greenhouse Gas Management Inventory System. “This is where all our efforts converge,” he said. “The system will be the hub for data collection, analysis, and archiving, ensuring that our climate actions are grounded in evidence and accountability.”

Dr. Bappa concluded with a call for unity and collaboration. “This project is more than a technical exercise—it is a national imperative. Together, we can ensure that Nigeria not only meets but exceeds its climate commitments,” he stated.

Technical Presentation of Consultants

During the ICAT Phase II inception workshop, expert consultants delivered detailed presentations on the scope of their work, approaches, and methodologies. Each consultant outlined their strategies for advancing Nigeria's climate transparency initiatives under the Enhanced Transparency Framework (ETF) of the Paris Agreement.

Engr. James Ogunleye, Energy and MRV Guidelines Consultant

The Energy and MRV Guidelines Consultant focused on developing an MRV framework for the energy sector to track progress in implementing Nigeria’s Energy Transition Plan (ETP) while aligning it with the Nationally Determined Contributions (NDCs). Their work involves generating GHG emission projections for the energy sector under various scenarios and assessing the impact of renewable energy policies such as feed-in tariffs. They emphasized collaboration with stakeholders, including the Federal Ministry of Power, private sector entities, and sub-national actors, to ensure a comprehensive approach. The methodology includes reviewing Phase I outcomes, estimating GHG impacts, and validating the MRV framework through workshops and consultations. Special attention is given to incorporating off-grid solar systems and future-proofing the framework for emerging sectors like hydrogen.

Professor Imoh Obioh, GHG Inventory Management System Expert

The GHG Inventory Management System Expert presented plans to operationalize a national GHG Inventory Management System (GHGIMS) for Nigeria, focusing on standardizing data collection and reporting across sectors. This involves developing QA/QC protocols, training NCCC staff on tools like IPCC software, and piloting

the system with real-time data input to test functionality. The expert stressed the importance of harmonizing corporate and national reporting systems and ensuring that sub-national entities can access and utilize the system for decision-making.

Igwebuike Ijeoma, IPPU Sector Consultant

The IPPU Sector Consultant addressed the challenges of developing a robust MRV framework for the Industrial Processes and Product Use (IPPU) sector. Given the sector's complexity and fragmentation, the consultant's approach emphasized engaging with industrial stakeholders to create a coordinated reporting structure. The methodology involves scoping and gap analysis, mapping data flows, and developing sectoral guidelines tailored to align and adapt to diverse sub-sectors of the IPPU. The framework is designed to align with international reporting standards while remaining flexible to new regulations and emerging industries.

Dr. Stella Adejo, Agriculture and Land Use (AFOLU) Consultant

The Agriculture and Land Use (AFOLU) Consultant focused on integrating climate-smart agriculture and agroforestry practices into the MRV framework. Recognizing the regional variations in agricultural practices, the consultant emphasized the importance of engaging with local stakeholders, including farmer associations and extension services, to ensure accurate data collection. The proposed methodology includes stratified sampling for smallholder farms and incorporating community-level monitoring tools for carbon sequestration in agroforestry systems. Pilot programs will be conducted to test the applicability of the guidelines in diverse agricultural zones.

Agbo Chinonso Bathlomeo, Forestry, Land Use, and Land-Use Change (LULUCF) Consultant

The Forestry, Land Use, and Land-Use Change (LULUCF) Consultant highlighted the need for a comprehensive MRV framework to monitor deforestation, afforestation, and land-use changes. They proposed leveraging satellite imagery and remote sensing technologies for real-time monitoring and aligning these efforts with Nigeria's REDD+ program. Stakeholder mapping and collaborations with forestry departments and REDD+ stakeholders are central to their approach. The consultant plans to develop guidelines for estimating GHG emissions and carbon sequestration, ensuring compatibility with international standards.

Each consultant presented a thorough roadmap, emphasizing collaboration, capacity building, and alignment with Nigeria's climate goals and international obligations.

Presentation on Key Priority Areas of the Nigeria ICAT Project Phase II Work Plan, including the Implementation Strategy, Stakeholder Consultations, Report Analysis and presentation, among others -Dr. Julien Vincent (CITEPA), Dr. Mike Bess (GHGMI) - ICAT Team of Consultants

Dr. Julien Vincent (CITEPA) and Mr. Mike Bess (GHGMI) presented a comprehensive overview of the key priority areas for the Nigeria ICAT Project Phase II Work Plan during the inception workshop. Their presentation focused on the implementation strategy, stakeholder consultations, report analysis, and other significant aspects of the project.

They began by emphasizing the importance of **operationalizing the MRV framework**, which is fundamental to tracking progress on Nigeria's NDCs and meeting its commitments under the Paris Agreement. This phase involves developing sectoral guidelines across the five IPCC sectors to standardize methodologies, ensure quality assurance (QA/QC), and establish clear roles and responsibilities for stakeholders. Tools such as the RISQ platform, previously developed for the energy and waste sectors, were highlighted as essential for harmonizing data flows and ensuring consistency in reporting.

Stakeholder consultations were presented as a cornerstone of the operationalization process. Vincent and Bess stressed the value of leveraging insights from sectoral experts and feedback from Nigeria's first Biennial Transparency Report (BTR). These consultations aim to refine data collection protocols, identify new indicators for NDC updates, and strengthen the MRV framework.

The second key area was **capacity building for the National Council on Climate Change (NCCC)**. The presenters outlined plans to equip the NCCC team with the skills and tools necessary to operate an effective GHG Inventory Management System (GHGIMS). This includes training sessions on ETF obligations, IPCC methodologies, and practical tools like the RISQ platform. Workshops will bring together experts from diverse sectors to reinforce understanding and facilitate collaboration.

Dr. Vincent and Mr. Bess then discussed the **development of the IPPU sectoral MRV framework**, a critical focus of Phase II. They described plans to conduct a needs and gap assessment of the sector, mapping stakeholders and data flows, and developing institutional arrangements to integrate IPPU into the national MRV system. The consultants emphasized the diversity of the IPPU sector and the need for tailored approaches to address its unique challenges.

Tracking progress in the **Energy Transition Plan (ETP)** was another priority area. They highlighted activities such as revisiting the assessments from Phase I to develop GHG emission projections under different scenarios. The ICAT Renewable Energy Policy Assessment Guide will be applied to evaluate the GHG impacts of Feed-in Tariffs (FIT) and other policy measures, ensuring alignment with NDC targets.

The presentation also touched on **knowledge sharing and reporting**, which will involve synthesizing insights from the project and presenting them in accessible formats for stakeholders. Reports will detail progress, highlight challenges, and propose recommendations for strengthening Nigeria's climate transparency systems.

The presenters concluded by reiterating the importance of collaboration and stakeholder engagement in achieving the project's goals. They called for active participation from MDAs, private sector actors, and development partners to ensure the successful implementation of the ICAT Phase II Work Plan. Their detailed and methodical approach set the tone for constructive discussions during the workshop, paving the way for robust climate action transparency in Nigeria.

Reactions Comments and Questions

1. Energy and MRV Guidelines Consultant Presentation

Comment 1

"The proposed MRV guidelines are comprehensive, but have you considered integrating the emerging hydrogen sector into Nigeria's energy transition plan? It's gaining traction globally and could be a game-changer for reducing industrial emissions," asked a representative from the Ministry of Industry.

> **Response:** The consultant replied, "Indeed, hydrogen is a promising area. While it's not explicitly outlined in the current scope, the MRV framework has provisions for future sectoral expansions. We will recommend a pilot study for hydrogen sector integration in subsequent updates."

Comment 2

"The section on feed-in tariffs (FIT) is excellent, but it seems to focus solely on grid-connected solar PV. Off-grid systems, especially in rural areas, are equally critical for emission reductions," suggested an energy expert from an NGO.

Response: "That's a valid observation," acknowledged the consultant. "We will revise the scope to include off-grid solar systems and ensure their contributions are reflected in the GHG inventory."

Question 1
"How will the framework ensure uniformity in GHG data collection across states, especially in regions with limited technical capacity?"

Response: The consultant explained, "Uniformity will be achieved by deploying standardized data collection templates and conducting targeted capacity-building workshops in states with limited expertise."

- **Question 2:**
"How will MRV outputs feed into the monitoring of Nigeria's Energy Transition Plan (ETP)?"

Response: The consultant stated, "The MRV outputs will directly inform progress tracking under the ETP. We are establishing links between MRV indicators and ETP targets to ensure alignment."

2. GHG Inventory Management System Expert Presentation

Comment 1
"The plan for QA/QC protocols is commendable, but given Nigeria's diverse sectors, how will you tailor these protocols to address sector-specific challenges?" asked a senior official from the Federal Ministry of Environment.

Response: "We'll develop sector-specific QA/QC checklists, focusing on unique data flows and challenges in each sector, while maintaining overall coherence with the national MRV framework," the expert replied.

Comment 2
"Data accessibility is critical. Will stakeholders, especially sub-nationals, have adequate access to the GHG inventory management system for decision-making?" queried a participant from the National Bureau of Statistics.

Response: "The system will have tiered access levels. Sub-nationals will have access to data relevant to their jurisdictions to inform policy decisions," explained the expert.

Question 1
"Will the system allow real-time reporting for private-sector actors, especially those already managing their GHG inventories?"

Response: The expert assured, "Yes, the system will include a real-time reporting feature for stakeholders. We will also establish a mechanism to harmonize corporate and national reporting formats."

- **Question 2**
"How do you plan to manage data gaps, particularly in emerging sectors like digital industries?"

Response: The expert responded, “For emerging sectors, we’ll use proxy data and international benchmarks until local data systems are established.”

3. IPPU Sector Consultant Presentation

Comment 1
“The focus on institutional arrangements is great, but the manufacturing sector is fragmented. How will you ensure coordinated reporting across such diverse players?” asked a Manufacturers’ Association of Nigeria (MAN) representative.

Response: “We will establish a reporting framework incorporating industrial clusters and trade associations to streamline data collection and reduce fragmentation,” the consultant replied.

Comment 2
“The MRV framework must be adaptable to new regulations. Will the system be flexible enough to incorporate future industrial emission standards?”

Response: “Absolutely. The framework will be designed with modular components, making it adaptable to new regulatory changes or standards,” the consultant affirmed.

Question 1
“What strategies will you employ to address data unavailability in less-documented IPPU sub-sectors?”

Response: “A phased approach will be deployed, prioritizing key sub-sectors first. For others, international default values will be used until local data systems are robust, credible, and reliable enough to inspire confidence in their use cases,” explained the consultant.

- **Question 2**
“How will you ensure stakeholder engagement, particularly for small and medium enterprises (SMEs)?”

Response: “We will host sector-specific workshops and create simplified guidelines to ensure SMEs are not excluded from the MRV processes,” stated the consultant.

4. Agriculture Expert Presentation

Comment 1:
“Climate-smart agriculture is pivotal, but the framework seems urban-centric. How do you plan to reach rural farmers effectively?” asked a representative from All Farmers Association of Nigeria (AFAN).

Response: The expert responded, “We’ll work closely with extension services and local NGOs to disseminate MRV guidelines in rural areas.”

Comment 2:
“The integration of agroforestry is commendable. Will the framework support tracking carbon sequestration at the community level?”

Response: "Yes, we'll include tools for community-level monitoring of carbon stocks, aligned with national indicators," assured the expert.

Question 1:
"How will the framework ensure accurate data collection for smallholder farms, given their diverse practices?"

Response: "We'll use stratified sampling methods and integrate community-based data collection approaches to ensure accuracy," the expert explained.

Question 2:
"How will the MRV system handle regional variations in agricultural practices?"

Response: "We'll design region-specific modules within the MRV framework to reflect unique practices and conditions," the expert replied.

5. Forestry, Land Use, and Land-Use Change (LULUCF) Consultant Presentation

Comment 1:
"Illegal logging remains a significant challenge. How will the MRV framework capture data on this issue?" asked a National Environmental Standards and Regulations Enforcement Agency (NESREA) representative.

Response: "We'll deploy remote sensing tools and collaborate with enforcement agencies to track illegal logging activities and their impact," the consultant explained.

Comment 2:
"The use of satellite imagery is an excellent idea. Will it also help track deforestation trends over time?"

Response: "Yes, satellite imagery will provide time-series data to monitor deforestation and afforestation trends," the consultant confirmed.

Question 1:
"How will private investments in sustainable forestry be incentivized through the MRV system?"

Response: "The MRV framework will highlight emission reductions from private projects, potentially qualifying them for carbon credits or tax incentives," the consultant responded.

Question 2:
"What steps will you take to align the MRV framework with Nigeria's REDD+ program?"

Response: "We'll coordinate closely with REDD+ stakeholders to ensure our methodologies and reporting formats are aligned," the consultant assured.

Table 2: Nigeria-ICAT Project Team

A. National Project Consultants

S/N	Names	Responsibility
1.	Dr. Bala Bappa	Coordinating Consultant/In-Country Facilitator
2.	Engr. James Ogunleye	Lead Consultant, Energy
3.	Prof. Imoh Obioh	Consultant, GHG Inventory Management
4.	Mr. Igwebuike Ijeoma	Consultant, Industrial Processes and Products Use (IPPU)
5.	Mr. Agbo Chinonso Bathlomeo	Consultant, Land Use, Land Use Change and Forestry (LULUCF)
6.	Dr. Stella Adejoh	Consultant, Agriculture (Crops and Livestock)

B. National ICAT Project Steering Committee – National Council on Climate Change

S/N	Names	Responsibility
1.	Dr Nkiruka Maduekwe	DG/CEO NCCCS ICAT Focal Point
2.	Halima Bawa Bwari	Director (RPP), Alternate Focal Point
3.	Adesola Olatunde Effiwatt	Team Lead, ICAT
4.	Jummai Vandu	Member
5.	Jumoke Salako	Member
6.	Murtala Abdullahi	Member
7.	Oketta Onafuje	Member
8.	Sandra Onyeanusi	Member
9.	Chinwe Adindu	Member
10.	Kajie Etta	Member

C. International Consultants Team

S/N	Names	Responsibility
1.	Julien Vincent	CITEPA, France - Lead
2.	Mike Bess	GHGMI, Ireland - Co-Lead

Table 3: List of Workshop Participants

S/N	Name	Organization	Gender
1	Agugua Stephen	International Labour Organization (ILO)	M
2	Awodele Paul Ibukun	Federal Ministry of Housing and Urban Development (FMHUD)	M
3	Juweh Richard	Federal Ministry of Transport (FMT)	M
4	Amodu Philip O.	National Space Research and Development Agency (NASRDA)	M
5	Oshionameh Ajayi	The Electricity Hub (TEH)	F
6	Dr. Natasha Aduloju	Vitalera Integrated Consult	F
7	Akinbola Olanke	National Commission for Persons with Disabilities (NCPWD)	F
8	Ibitoya Ayorinde Ibitayo	National Commission for Persons with Disabilities (NCPWD)	M
9	Dr. Terkimbi Tom	Community Links and Human Empowerment Initiative (CLHEI)	M
10	Akinbora Olukayode E.	Federal Ministry of Livestock Development (FMLD)	M
11	Salamu Ahmed	Small and Medium Enterprises Development Agency (SMEDAN)	M
12	Tolulase Oyemoni	Federal Ministry of Labour and Employment (FML&E)	
13	Dr. Bala Bappa	ICAT In-Country Coordinator	M
14	Dr. Henning Wuester	ICAT Director	M
15	Adesola Olatunde Effiwatt	National Council on Climate Change Secretariat (NCCC-S)	F
16	Jummai Vandy	NCCC-S	F
17	Sumaiya Muhammed	NCCC-S	F
18	Murtala Abdulahi Y.	NCCC-S	M
19	Jeremiah Ato	Sustainable Research and Action for Environmental Development (SRADEV) Nigeria.	M
20	Olusegun Shogbola	NCCC-S	M
21	Olafemi John	NCCC-S	M
22	Dr. Maria A. Amadu	Federal Ministry of Education (FME)	F
23	Adebowale S. Adeyinka	National Bureau of Statistics (NBS)	M
24	Njoku Chinenye	Agro-Climate Resilience in Semi-Arid Landscapes (ACRESAL)	F
25	Osamuduaven Idumudu	Federal Radio Corporation of Nigeria (FRCN)	F
26	Chichi Umeseaka	UTV Africa	F
27	Pirfea Venmak Nimyel	Nigeria Metrological Agency (NiMet)	M
28	Abdulazeez Abdulfatai	Nigeria Electricity Regulatory Commission (NERC)	M
29	Ogungboye Adefolarin	FMWR&S	F
30	Dr. Florence N. Mshelia	Steel Development	F
31	Dosigu Agbadu-Aau	National Environmental Standards Regulatory Enforcement Agency (NESREA)	F
32	Pauline Jungashi	Global Initiative for Food Security and Ecosystem Preservation (GIFSEP)	F
33	James Ogunleye	ICAT National Consultant	M
34	Igwebuike Ijeoma	ICAT National Consultant	M
35	Agbo Chinonso Bathlomeo	ICAT LULUCF Consultant	M
36	Aderemi Egberongbe	Nigeria National Petroleum Company (NNPC) Limited	M

37	Mamman Naliba E.	Nigeria Midstream and Downstream Petroleum Regulatory Authority (NMDPRA)	F
38	Dr. Stella O. Adejo	ICAT Agriculture Consultant	F
39	Dr. Nnamdi I. Maduekwe	National Population Commission (NPopC)	M
40	Ikalaga Elijah	Natural Eco Capital (NEC)	M
41	Fawab Yunusa Mohammed	NCCC-S	F
42	Eha Michael B.	Enviro News	M
43	Opoola Abdullateef	Federal Ministry of Agriculture and Food Security (FMAFS)	M
44	Nkoli Ohoudu	African Independent Television (AIT)	F
45	Onuegbu Glorious	Federal Ministry of Agriculture and Food Security (FMAFS)	F
46	Imoh Obioh	ICAT GHG Inventory Management Consultant	M
47	Obioh Unwana	Research Assistant, ICAT GHG Inventory Consultant	F
48	Dr. Mmadu Samuel	Nigeria Educational Research and Development Council (NERDC)	M
49	Salako Olumide Tony	Department of Lands and Climate Change Management Services (DALCCMS), Federal Ministry of Agriculture and Food Security (FMAFS)	M
50	Ibrahim Muhammad	Nigeria Upstream Petroleum Regulatory Commission (NUPRC)	M
51	Dr. Ighalo Odiagbe	Nigeria Educational Research and Development Council (NERDC)	M
52	Dr. Eugene Itua	Natural Eco Capital (NEC)	M
53	Dr. Basiru Shehu Gwandu	Agricultural Research Council of Nigeria (ARCN)	M
54	Yusuf Bello Habib	Energy Commission of Nigeria (ECN)	M
55	Ahmed Galadanci	CEESOLAR	M
56	MC-Sojadatu Cynthia	NCCC-S	F
57	Prof. Nap Okoh	Rural Electrification Agency (REA) Nigeria Energy Program (NEP)	M
58	Isa Abulkasim	National Emergency Management Agency (NEMA)	M
59	Omini John Ikpi	Federal Ministry of Works (FMW)	M
60	Muhammed Abubakar Dagoli	Federal Ministry of industry, Trade and Investment (FMITI)	M
61	Brook Godwin	Federal Ministry of Health (FMOH)	M
62	Philemon Jilleng	Nigeria National Petroleum Company (NNPC) Limited	M
63	Ezuma Okoronkwo	AP3 Advisory	M
64	Abdul Okadura Gabriel	Africa Independent Television (AIT)	M
65	Titiloye O. Charles	Abuja Environmental Protection Board (AEPB)	M
66	Jenifer E. Akor	Federal Ministry of Science, Technology and Innovation (FMSTI)	F
67	Chief Obinna Nwaka	Federal Ministry of Youth Development (FMYD)	M
68	Amb. Nuttu Akum	Committee of Youth on Mobilization and Sensitization (CYMS)	M
69	Nnenna California	Federal Ministry of Environment (FMENV)	F
70	Olagunju Kehinde J.	National Bureau of Statistics (NBS)	M
71	Amobuchukwu Eke	Ministry of Petroleum Resources (MPR)	M
72	Soala Martyas Yellowe	National Environmental Standards Regulatory Enforcement Agency (NESREA)	M
73	Brown Domhat Isu	UTV Africa	M
74	Dorathy Ukemezia	NCCC-S	F

75	Hycienth Akpan	UTV Africa	M
76	Chibuzor Ekeh	CEESOLAR	M
77	Austine Onele	Vidoha	M
78	Aisha Mohammed	NCCC-S	F
79	Nwogu Chigozirim S	NCCC-S	F
80	Engr. Agatha Orisananye	Federal Ministry of Petroleum Resources (FMPR)	F
81	Olalekan Adijor	DCP Medic	M
82	Musibau Nurudeen B.	Federal Ministry of Innovation, Science and Technology (FMIST)	M
83	Isaac Osanu	Federal Ministry of Innovation, Science and Technology (FMIST)	M
84	Stephen Douglas Ibinabo	Federal Ministry of Women Affairs (FMWA)	F
85	Benjamin Mukoro	Global Centre for Law, Business and Economy (GCLBE)	M
86	Amelu Chukwujekwu Oyoma	Federal Ministry of Women Affairs (FMWA)	M
87	Bernadette Ejiofor	NCCC-S	F
88	Abdulrahman M Garba	NCCC-S	M
89	Muhammed Samuli	Freelance Consultant	M
90	Asmau Jubril	NCCC-S	F
91	William Abok	UTV Africa	M
92	Adepoju Olusola Timothy	UTV Africa	M
93	Owuama Uche	Federal Ministry of Education (FME)	F
94	Asuzu Echezona	Nigeria Labour Congress (NLC)	M
95	Yusuf Kelani	Special Assistant to the President (SAP) on Climate Change Matters.	M
96	Ibrahim A Shelleng	Senior Special Assistant to the President on Climate Finance	M
97	Mohammed B Adamu	Federal Ministry of Transport (FMOT)	M
98	Anuli Onwucheta	Federal Ministry of Transport (FMOT)	F