Department of Climate Change
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Oil and Gas Sectoral Institutional MRV System

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

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Abbreviations

BTR	Biennial Transparency Report
BUR	Biennial Update Report
CDM	Clean Development Mechanism
CLN	Carbon-Limits Nigeria
COP	Conference of Parties
DCC	Department of Climate Change
DPR	Department of Petroleum Resources
EF	Emission Factor
FMEnv.	Federal Ministry of Environment
GHG	Greenhouse Gas
HSE	Health Safety and Environment
IOC	International Oil Companies
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
JV	Joint Venture
LDAR	Leak Detection and Repair
MA	Mitigation Actions
MFP	Marginal Field Producers
MPR	Ministry of Petroleum Resources
MRV	Measurement, Reporting and Verification
NC	National Communications
NCV	Net Calorific Value
NDC	Nationally Determined Contribution
NGC	Nigeria Gas Company
NGFCP	Nigeria Gas Flare Commercialization Programme
NLNG	Nigerian Liquified Natural Gas Limited
NNPC	Nigerian National Petroleum Corporation
NOC	National Oil Companies
NPDC	Nigerian Petroleum Development Company
O&G	Oil and Gas
PPMC	Pipeline and Products Marketing Company
QA	Quality Assurance
QC	Quality Control
TACCC	Transparency, Accuracy Consistency, Comparability, and Completeness
TWG	Technical Working Group
UNFCCC	United Nations Framework Convention on Climate Change
WRI	World Research Institute

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Executive Summary

The oil and gas (O&G) sector is a key contributor to economic growth in Nigeria but also a major contributor of greenhouse gas (GHG) emissions. To reduce these GHG emissions, a good understanding of the emissions sources, feasible mitigation actions and a framework for reporting these actions is essential. The main objective of this document is therefore on the Measurement, Reporting and Verification (MRV) framework for the O&G sector. The document focuses on how to transparently implement an MRV framework for GHG Inventory and Mitigation in the oil and gas sector in line with the Paris Agreement. A well-designed MRV for the O&G sector, as proposed in this document, will increase the transparency of impacts of mitigation efforts. It will also enhance and improve planning, implementation, and provision of data and information to meet the reporting requirements under the UNFCCC.

This report aims to provide advice on good MRV practices for the O&G sector to enable decision and policy makers to set up the institutions for GHG Inventory and mitigation actions. This is very relevant for the implementation of Nationally Determined Contributions (NDCs) that countries submitted when ratifying the Paris Agreement.

The introduction (Chapter 1) focuses on the scope and objectives of the MRV process. In Chapters 2 – 6, the key components of institutional arrangements for GHG Inventory and Mitigation are set out. Chapter 2 explains the organizational mandates for stakeholders involved in GHG Inventory and Mitigation actions in the O&G sector. It also investigates the existing mandates set by the various levels involved in the sector's institutional arrangement. Chapter 3 focuses on the level of expertise available among stakeholders and the requisite experience needed to have a robust sectoral MRV system. Chapter 4 of the report focuses on data flow, which is fundamental to achieve harmonized, consistent definitions and methodologies for data collection among the various stakeholders and institutions engaged in the sector. Chapter 5 explains the coordination, system and tools required for the GHG Inventory process and mitigation actions. In Chapter 6, the O&G stakeholders are identified, and their roles and responsibilities in the GHG Inventory process and mitigation actions are identified.

Chapter 7 focuses on institutional arrangement. This is built with the sense of the key principles, such as comprehensiveness, relevance, consistency, transparency, accuracy, accessibility, and effectiveness. The chapter highlights the significance of various levels in the institutional framework and the arrangements necessary to ensure institutional co-ordination for MRV in the O&G sector. The process of collecting data, and processing and reporting relevant data, are stated in this section. As relevant information is often widely dispersed and collected by many publics, and to a large extent, private institutions in the case of O&G, institutional arrangements define the stakeholders and the type of data expected from them for the GHG Inventory and Mitigation processes to work well.

The last section of the document (Chapter 8) focuses on the work plan and the road map towards actualizing an efficient MRV system for the O&G sector and the expected range of timelines to implement them. The intent is to ensure that before the next NDC cycle revision (2025), an efficient MRV system will have been put in place. Furthermore, quality assurance and quality control (QA/QC) is also defined for MRV in the O&G sector to ensure critical elements are addressed to ensure transparency and to strengthen confidence among decision-makers and stakeholders in the MRV process. The institutional arrangements, if adopted, will promote the transparency required to achieve the objectives of the Paris Accord.

Chapter One - Introduction

1.0 MRV Overview

Oil and Gas (O&G) as one of the focal sectors in Nigeria Nationally Determined Contributions need a comprehensive and reliable flow of data and information on greenhouse gas (GHG) trends and projections that are well communicated among the Industry Stakeholders and the Public. The importance of quality data cuts across all the actors in the sector; to the government and top management, a reliable set of data will guide in the formulation of policies and measures, understanding of climate risks as well as serve as indicators for opportunities and actions that can be implemented to reduce GHG emissions. Also, it gives clarity to prospective investors and the government, to gain the level of support needed and to help track the support received for climate action.

It is therefore imperative that the O&G sector operationalizes a robust Measurement, Reporting and Verification (MRV) system that will ease the collection of information and data necessary for evidence-based national decision-making and timely submission of quality national reports to fulfill the Paris Agreement. It should be noted that data are collected and reported annually in the O&G Industry considering the critical nature of the industry to Nigeria's economy, which also fits into the institutional arrangements in line with Article 13 of the Paris Accord on transparency.

The key function of an MRV system is to enhance transparency through the tracking of national GHG emission levels, climate finance flows received and the impact of mitigation actions. MRV System for the O&G sector will facilitate sharing of information and lessons learnt through robust monitoring to track and assess whether set targets are being achieved. This will create transparency, showing continuity in the sectors action, as such strengthening the trust of climate finance donors and other investors.

Transparent MRV approaches would improve comparability at the national and international level, supporting coherence between domestic and international MRV systems. When detailed reporting on MRV takes place, as in National Inventory Reports under the United Nations Framework Convention on Climate Change (UNFCCC), it enhances the identification of best practices. For example, nationally, MRV enhances capacities to generate and compile the information needed to plan, implement, and coordinate individual mitigation activities.

In the past, MRV systems have been more inclined to developed countries, while developing countries reported their emissions through their National Communications (NCs) because they had neither the obligation to meet specific emission targets nor the ability to comprehensively track and report progress in terms of emission reductions from GHG levels. However, since the inception of the Paris Agreement in 2015, the distinction between developed and developing countries no longer exist as most of the developing countries have now indicated an interest in addressing climate issues by developing their climate actions, bearing in mind the peculiarities of their countries.

This is in line with Article 12 of the Convention which mandates all parties of the Paris Accord to communicate their GHG emission. *"Article 12 of the Convention obliges all parties, in accordance with Article 4, paragraph 4, to communicate to the conference of parties (COP) information relevant to the implementation of the convention, including in relation to emissions and removal. This allows the convention to have reliable,*

transparent and comprehensive information on emission, actions and support, thereby forming the basis for understanding current emissions levels, and the ambitions of existing efforts, as well as progress on both the national and international scale".

UNFCCC Handbook

Countries that are parties to the Paris Accord have made their climate action commitments by developing and submitting their NDCs (inclusive of the relevant sectors) to the UNFCCC. The goals of the NDCs in developing a sustainable MRV system cannot be overemphasized. This is because MRV systems are used to ensure that the respective countries' NDCs and subsequent updates are transparent, reasonable, measurable, and achievable and can be verified in line with available international best practice. This was further stressed at COP 24 in Katowice where the guiding principles for the modalities, procedures, and guidelines (MPGs) of the enhanced transparency framework under the Paris Agreement was established. This guiding principle emphasized the need to improve reporting and transparency over time as countries will now be required to submit their first biennial transparency report (BTR) in 2024, promote transparency and comparability in reporting, avoid duplication of work and reduce undue burden on parties and the secretariat.

Developing an MRV system consists of three key independent processes, that is, Measurement, Reporting and Verification. An essential component of every climate mitigation action is largely linked to having a clear understanding of the GHG emissions, the respective sources, and the inherent impact from the implemented mitigation strategy. Thus, MRV describes all measures used by countries or companies to gather data for,

- Estimating GHG emissions (activity data and the relevant emission factors associated with the respective activities)
- Developing and reporting mitigation actions and,
- Tracking support received for implemented climate actions.

MRV Principles

When developing the O&G MRV system, five basic principles were critically considered. These principles include Transparency, Accuracy, Consistency, Comparability; and Completeness (TACCC) forming the basis of all MRV processes and must be strictly adhered to for sustainability.

- ***Transparency***: all assumptions and methodologies for an inventory, mitigation action and support will be clearly explained in simple and transparent terms to allow for replication and assessment of the inventory by users of the reported information.
- ***Accuracy***: this refers to the relative measure of the exactness of emissions or removal estimated. Estimates will be accurately made such that they are neither systematically overstated nor understated, adjudged, with uncertainties reduced as far as practicably reasonable. Appropriate methodologies will be used to promote accuracy in accordance with the relevant MRV system guidance.
- ***Consistency:*** Inventory, mitigation action and support will be internally consistent in all its elements when compared to other years. Inventory is termed consistent if the initial methodologies used are the same as the subsequent years and with consistent data sets applied to estimate emissions or removals from sources or sinks.
- ***Comparability***: estimates of emissions and removals reported will be comparable among all reporting Parties.

- ***Completeness:*** Inventory, mitigation action and support will cover all relevant sources and sinks, as well as all gases. Completeness means full geographic coverage of all sources and sinks**.**

MRV Concepts

This framework will specifically function as a roadmap for the development of a structured MRV system for the Nigerian O&G. Appropriate decisions, goals, and levels of activities in each category must be ascertained. Monitoring (or measuring) shall involve the methods used to track specific activities and impacts within the O&G sector. Reporting shall refer to the approach used to transparently communicate measured information to national stakeholders and/or the international community. Verification must aim to ensure that the measured and reported information are accurate and complete.

For a broader perspective to developing the O&G MRV system, an elaborate MRV concept is stated below.

Measurement (M): Measurement sets the path for the reporting and verification concept; measurement applies to data and information related to GHG emissions, mitigation actions and support. Measurement can be carried out at the national, sectoral, and industry (facility) level. However, for the O&G sector, measurement is peculiar to the facility level, and this shall be achieved through the direct and estimated measurement.

- ***Direct measurement:*** *This shall be carried out using specialized devices to obtain GHG emission and must be done continuously or by sampling.*

- ***Estimation:*** *This shall involve calculations using simple models. The calculation is done with strict guidelines and protocols, as referenced in the Intergovernmental Panel on Climate Change (IPCC) Guidelines and Clean Development Mechanism (CDM) methodologies and this must be strongly adhered to.*

The O&G sector should employ the use of estimation method. However direct measurement should also be encouraged to ensure continuous improvement in data quality so as to enhance the estimation method required to achieve improved GHG emission estimate and mitigation outcome. For example, the use of direct field measurement in the case of fugitive methane can be used to improve emission factors that could enhance emission estimates.

Reporting: The Reporting process is the compilation and documentation of the collected/measured information/data from the respective O&G sector. This includes the GHG inventory, mitigation actions, their effects, constraints, and gaps encountered, support needed and received, and any other relevant information. For data and information involving the O&G sector, reporting will be communicated through national reports such as the NC, NDC and the Biennial Update Reports (BUR) to the UNFCCC. However, with the Biennial Transparency Report (BTR), or GHG inventory reports, an important set of guidelines must be put into consideration, thus reflecting the National Inventory Report, track the progress of implementation and achievements, climate change impact and adaptation as well as finance and technology needed and received.

In line with the current narrative, the national communication will be submitted to the UNFCCC every four years, while the BUR will be submitted every 2 years. This is relevant since it will provide an update on all GHG

inputs in the national communication. Nigeria being a party to the UNFCCC, is required to report its actions in addressing climate change in their NCs, including information on national circumstances, GHG inventories, adaptation, mitigation actions and all support received for carrying out these climate actions. Thus, the O&G sector being a relevant stakeholder needed to reduce the national emission, will ensure transparency in reporting emissions from flares, combustion, vents, and fugitives. This will be achieved through the installation of calibrated meters within facilities, capacity building with the indigenous operators bringing them up to speed in calculating Emission Factors (EF). Critically, the compliance with reportage must be enforced by the Department of Petroleum Resources (DPR), who are the major custodians of data within the sector.

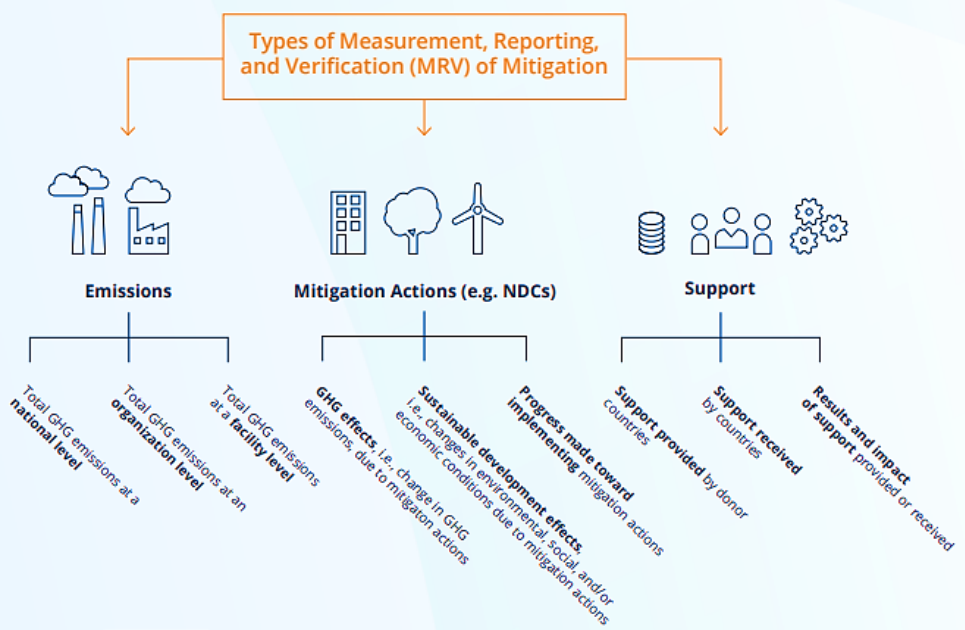
Verification: refers to reviewing the reported information to check its quality. Verification is either internal or external to ensure that the reported information follow established guidelines. Verification is imperative, such that it helps to implement quality assurance and quality control procedures at the national and sectoral level, to ensuring and improving transparency, accuracy, consistency, completeness, comparability, and the overall confidence in the values from the emissions estimate. Verification processes must be conducted internally or by a third party. For an adequate verification process in the O&G sector, third-party consultants must be recruited to carry out quality assurance and quality control (QA/QC) and a mandate or legally binding framework will be required to enhance transparency when submitting emission data.

1.1 MRV – Types and Relevance

The MRV systems comprise of three types namely:

- MRV of Emissions
- MRV of Mitigations
- MRV of Support

Figure 1 : Description of MRV Types



Source: National benefits of climate reporting Discussion Paper, 2018

MRV of GHG Emissions

The concept of MRV of GHG emissions entails measuring GHG emissions within activities of entities such as countries, organizations, or facilities and reporting the collected data in a GHG inventory and subjecting the process to review and verification.

MRV of emissions can be undertaken at the national, sectoral, and organizational levels. The GHG emissions estimation by the individual companies (organizational level) can be cascaded into the sectoral level. The process of MRV of GHG emissions on the national level involves consolidating the MRV of GHG emissions estimated at the sectoral level.

On the other hand, MRV of GHG emissions on the sectoral level involves building an organization-wide inventory of total emissions and removals from all sources (including stationary and mobile sources, and process and fugitive emissions) within the organization's boundary.

MRV of Mitigation Actions

MRV of mitigation actions involves implementing mitigation actions. "Mitigation actions" refer to interventions and commitments which include goals, policies, actions, and projects that are undertaken either by the government or private organizations/individuals with the goal to reduce GHG emissions. The Nigerian NDC is an example of mitigation action at the national level. The NDC describes for the O&G sector actions especially on gas flare reduction and commercialization plan. The concept of MRV of mitigation actions involves estimating, reporting, and verifying GHG emission reduction and sustainable development effects, as well as monitoring the implementation. MRV of mitigation action focuses on assessing the below objectives:

- ***GHG effects:*** MRV of Mitigation Actions (GHG effects) ascertains the actual or projected changes in GHG emissions and removals—as opposed to absolute levels of emissions and removals—due to the implementation of mitigation actions. MRV of GHG effects involves estimating changes in emissions resulting from all significant GHG effects of a mitigation action such as a reduction in flaring or decrease in GHG emissions due to reduced onsite fossil fuel consumption.

- ***Sustainable development effects***: for every mitigation action, the sustainable impact needs to be assessed and ascertained. Hence, the sustainable development effect refers to changes in environmental, social, and/or economic conditions that take place due to the implementation of mitigation actions. For example, assessing changes in the incidence of health problems due to air pollution among the community affected by a gas flare reduction project.

- ***Implementation progress:*** refers to monitoring, reporting, and verifying conformity with agreed modalities and approaches, and assessing progress made toward the implementation of mitigation action. This forms the basic pre-requisite for MRV of mitigation.

MRV of support:

Executing mitigation activities can be a major strain on project implementers, especially in countries (developing countries) whose economies may not be able to pay for undertaking mitigation actions themselves. Hence, the need for climate finance is provided by developed countries through appropriate international government, non-government, and private channels.

The concept of MRV of support is to track provision and receipts of climate support (finance, technology transfer and capacity building), monitor results achieved from the actual implementation of projects and assess the impact of the implemented projects. For instance, countries track financial support provided for mitigation efforts and building capacity.

At the same time, the recipient countries also track support received for various climate and other initiatives. It is imperative to note that support implies not only financing, but also technology transfer and capacity enhancement. Hence, the objective of MRV of support is essential to monitor the provision and receipt of financial flows, technical knowledge, and capacity building, and evaluating the results and impact of support.

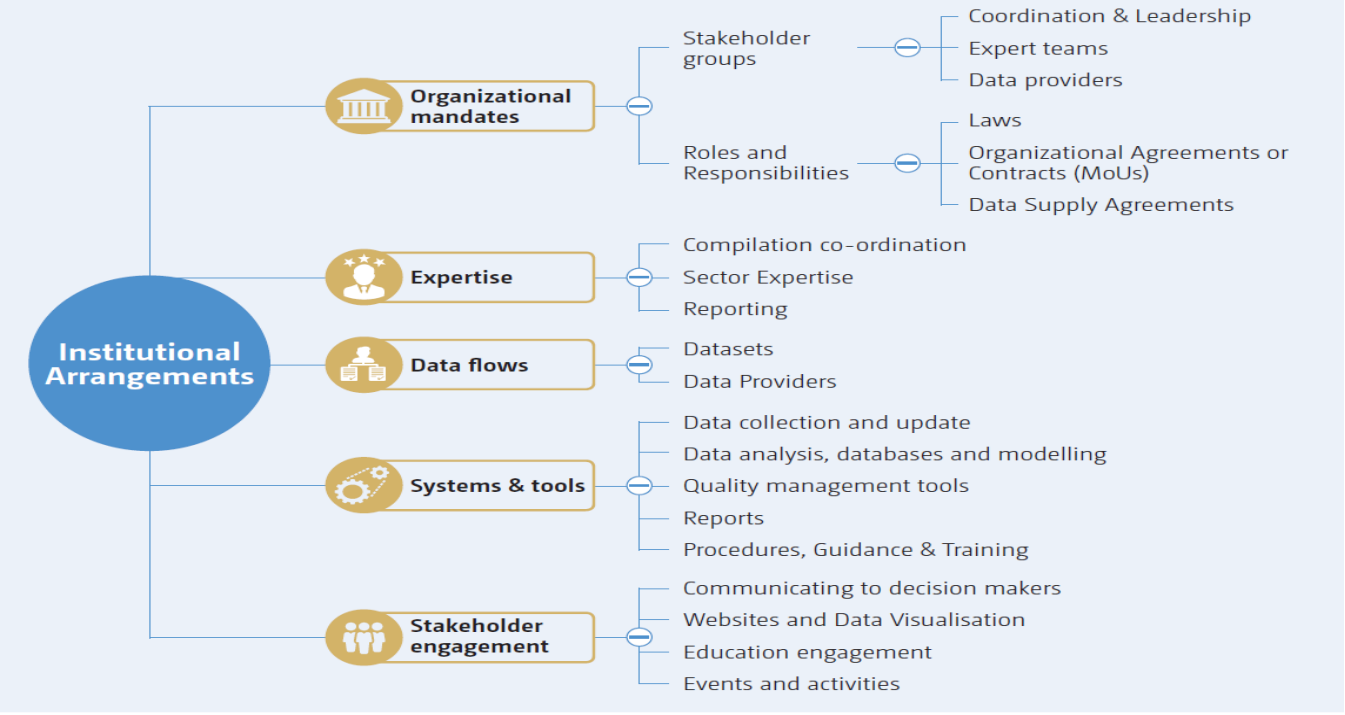
Key Components of Institutional Arrangements

Institutional arrangements may vary depending on the level of circumstances that are involved. However, it is important to set action targets and inform the stakeholders involved in the implementation of action targets. Institutional arrangements can be classified into five components; these components include both private and public organizations, government ministries and agencies, academic and research institutions, private entities, and consultants.

- Organizational mandates
- Expertise
- Data flows
- Systems and tools
- Stakeholder engagement.

The components of Institutional Arrangements need to be considered critically to build sustainable Institutional Arrangements frameworks (see Figure 2).

Figure 2: Key Components of Institutional Arrangement (*Source: CGE report, 2020*)



Source: UNFCCC Handbook, 2020

Chapter Two – Organizational Mandates

2.0 Overview

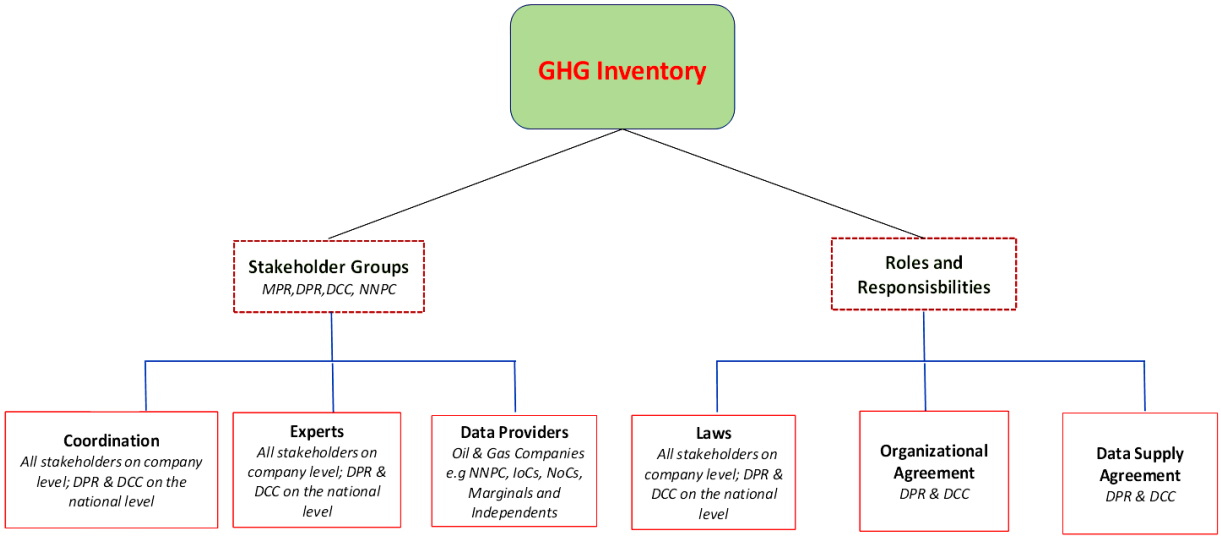
Organizational mandates clearly define the formal responsibilities of the stakeholders. These responsibilities are codified through laws, ordinances, legal documents, policies, and procedures. In the O&G sector, the mandates for stakeholders are usually made clear through acts, policies, and regulations under the Ministry of Petroleum Resources (MPR). While these mandates do not envisage an MRV system, several definitions spell out the responsibilities of all the stakeholders. However, it is important that the O&G sector going forward, ensure clearer mandates in line with the MRV process are put in place to guarantee a comprehensive line of functions.

2.1 GHG Inventory

Well defined organizational mandates play important roles in the development of GHG inventories. Mandates will help the stakeholders understand their roles and responsibilities when developing inventories either on the company, sectoral or on the national level.

Figure 3 below shows a robust GHG inventory flow chart of organizational mandates within the sector.

Figure 3: GHG Inventory/Mitigation Organizational Mandates



Source: CLN Analysis

Organizational Mandates for developing GHG inventories are considered from two broad perspectives that indicate the stakeholders involved in developing the inventories and their roles and responsibilities.

Stakeholder Groups: Stakeholder groups encompass every player (e.g., companies and regulatory agencies) in the sector. As stakeholders, every player has the mandate to carry out its inventories. For instance, the Nigerian National Petroleum Corporation (NNPC) can carry out inventories of its JV partners. However, the MPR through the DPR has the overall mandate for coordination and leadership as it oversees all activities that relate to inventories within the sector. Other stakeholder in the sector includes NESREA and NOSDRA who will work with the DPR to further ensure compliance of all regulatory framework in the sector.

Coordination: DPR coordinates and regulates all activities in the sector. The DPR coordinates the collection of GHG inventory data within the sector. However, there is no obligation that mandates DPR to send inventory data to the Department of Climate Change (DCC) of the Federal Ministry of Environment (FMEnv).
As part of the national institutional structure, there should be a mandate that obliges the DPR to send collated inventory data from the stakeholders/data providers to the DCC who oversees the national GHG inventories.

Expert Teams: All stakeholders in the sector are considered experts in their areas of operations. In the O&G industry, individual companies have the mandate to conduct their inventories. Usually, company experts (staff) work with consultants for these inventories.

The regulatory agencies such as DPR and DCC are also regarded as sector experts at the national level. DPR sets the guidelines for the sector. They present the professional guidelines and international standards for conducting inventories. DPR deploys their expertise in the areas of field inspections and collating necessary inventory data.

However, the experts that are commonly observed generally lack expertise in the MRV procedures and protocols. It is important that for the sector to build MRV experts, training and capacity building are important tools for experts to be use.

Data Providers: As it relates to the provision of inventory data, all the players (IOCs, NOCs, Marginal field producers, sole independent producers) are the data producers. The players are mandated to submit all inventory data to the DPR who over time have also been responsible for data QA/QC.

It is however recommended that to enhance the transparency framework, data QC should be handled internally at the stakeholder's level, while the QA must be undertaken by an external/independent third-party verifier who will be responsible for the process of data validation and verification as appropriate.

Roles and Responsibilities:
The DPR has the statutory responsibility as specified by its mandates to monitor compliance with petroleum laws, regulations, and guidelines in the sector. These mandates, as shown on the DPR website, give the DPR the legal mandate to monitor activities within the sector. Other mandates closely related to GHG inventories are highlighted below. However, the DPR is not limited to these mandates:

- Monitoring the Petroleum Industry operations to ensure that they are in line with national goals and aspirations including those relating to Flare down and Domestic Gas Supply Obligations.
- Maintaining records on petroleum industry operations, particularly on matters relating to petroleum reserves, production/exports, licences, and leases.
- Maintaining and administering the National Data Repository (NDR).
- Regulating Oil and Gas activities.
- Implementing government policies on Upstream Oil and Gas matters.

***Laws*:** Various laws regulate the O&G sector in Nigeria. The principals among these laws are the 1999 Constitution of Nigeria (as amended) and the Petroleum Act, which vests ownership and control of oil found

anywhere in Nigeria with the Federal Government. Apart from the 1999 Constitution, there is other legislation that impact, govern, and regulate the O&G sector in Nigeria e.g., the NNPC Act that established the NNPC and empowers it to participate directly in petroleum operations on behalf of the federal government.

The legal framework regulating the sector is based on several laws. The Federal Ministry of Petroleum Resources has primary responsibility for policy direction and exercises supervisory oversight over the industry. The Minister of Petroleum Resources issues regulations, guidelines, and directives pursuant to the Petroleum Act and other enabling laws.

With the petroleum industry act (PIA) recently passed into law, it is expected that it will change the dynamics of how the industry will be regulated and slightly the MRV system. The PIA envisages the creation of a separate entity for monitoring all upstream activities and another entity for monitoring both midstream and downstream operation. While clarity as to when this entity will be established and how they will operate cannot be ascertained as at the time of this MRV framework development. It is important that for the purpose of sustainability of the MRV and transparency, the role of the DPR should be transferred to the created upstream, midstream, and downstream regulatory entity as applicable, when the DPR is replaced. It is therefore expected that there will be synergy and coordination among the entities to be created under the PIA.

Organizational and Data Supply Agreements

The MPR through the DPR had set out organizational agreements for the sector players. These includes certificates of incorporation, certification for JV partnership etc.

Currently, data supply agreements which specify obligations and expectations of both the data provider and the data receiver on GHG inventory related data are not clear.

However, the DPR needs to clarify its stands on the issues of data supply agreements. The agreement should specify one or more of the following obligation types:

- **Data supply obligations:** while there exists a provision of data supply on production statistics, this should be enhanced to describe the provider's obligation stating it to provide data that are relevant for accounting for GHG inventory purposes in accordance with international reporting requirement.
- **Disclosure issues:** these include data protection, data usage, and restriction obligations.

2.2 Mitigation

Existing organizational mandates oblige all industry stakeholders to carry out actions and processes that are aimed at reducing GHG emissions. Mitigation actions are expected to be in line with best industry standards and reported to the DPR which is charged with the responsibility of coordinating the sector mitigation projects. All mitigation projects must be subject to validation and verification.

Validation involves the independent evaluation of a project activity against the project requirements. It is based on the project's design documentation which reflects the project's baseline, monitoring plan and compliance with relevant UNFCCC and host country's criteria. Validation establishes whether a project can generate tradable credits. Verification, on the other hand, involves a periodic review and ex-post

determination of the monitored GHG emissions reductions that have occurred as a result of a registered project activity.

For transparency, the process of data validation and verification is to be conducted by a third-party verifier or by an external entity after which data are to be reported to the DPR who should, in turn, be obliged to send the data to the DCC.

Stakeholders Group: The stakeholders are all the players in the sector (companies and regulatory agencies). On the company level, the stakeholders have the mandate to develop mitigation projects. However, data of all mitigation projects must be reported to the DPR and other relevant agencies.

Coordination: DPR coordinates and regulates all mitigation activities in the sector. The DPR coordinates the collection of project data in line with international standards.

Expert Teams: All stakeholders in the sector (company, sectoral and national) are considered as experts in their areas of operations. This also applies to regulatory agencies such as DPR and DCC who are also sector experts at the national level. DPR sets the guidelines for developing mitigation projects in the sector. They monitor compliance at every stage of the project implementation.

Data Providers: For mitigation actions, all stakeholders in the sector are also considered to be experts to carry out mitigation actions. Individual companies can deploy the strength of staff to implement mitigation actions. The regulatory agencies are also a part of the sector expert team as they set mitigation policies and laws for the sector. They also present the professional guidelines and international standards for mitigation projects, while also monitoring compliance. The regulatory agencies are also experts in the areas of field inspections of mitigation project sites.

On data, all sector players (IOCs, NOCs, Marginals field producers, and sole independent producers) provide data on mitigation projects. The companies are mandated to provide all data on mitigation projects to the DPR.

Roles and Responsibilities:
The DPR has the mandate to monitor all mitigation projects in the sector. The mandate gives the DPR the legal framework to monitor mitigation activities within the sector. As stated above for GHG inventory, the mandates of the DPR apply similarly for mitigation actions. Companies are also directly responsible to develop mitigation actions aimed at GHG emissions reduction.

***Laws*:** For mitigation projects, there are laws that govern the development of mitigation projects in the sector. For instance, the Environmental Impact Assessment (EIA) Act provides the framework for assessing the impact of O&G projects on the environment.

Organizational and Data Supply Agreements: The MPR has already set out agreements for the sector players to report mitigation actions to DPR. This includes, planned, ongoing and implemented projects. Some of these projects can also be referenced from the UNFCCC website for projects registered on the CDM platform.

Currently, data supply agreements for mitigation projects specifying obligations and expectations of both the companies and the data receiver (in this case DPR) is not very clear. As with the GHG inventory, the DPR needs to define the data type it shall be requesting for mitigation activities. Refer to Figure 3 as it is also applicable for mitigation projects.

Box 1: Activities to be included in O&G MRV System – Organizational Mandates

- *Quality Assurance and Control:* It is recommended that to enhance the transparency framework, data QA should be handled by an external/independent third-party verifier who will be responsible for all the processes of data validation and verification. The QC process should be handled internally both at the various stakeholder level and the level of the DPR to assure the quality of data provided. While QC of all inventory related activity data can be carried out at the level of the DPR, it needs to appoint an external/independent third-party entity to carry out quality assurance of the data after QC has been done. This could be done at least annually or as appropriate.
- Training and capacity building aimed at building MRV experts for the sector.
- MPR through DPR needs to ensure clarity and transparency issues on data supply agreement. The agreement should specify one or more of the following obligation types:
    - Data supply obligations: this should describe data provider's obligation stating the type of inventory activity data to provide in accordance with specific quality and temporal constraints.
    - Disclosure issues: these include data protection, data usage, and restriction obligations.
- Currently, there is no obligation that mandates DPR to send inventory and mitigation data to the DCC. There is the need for a mandate that obliges the DPR to send collated inventory and mitigation data from the stakeholders and data providers to the DCC who oversees the national GHG inventories and keep records of mitigation actions.

Chapter Three – Expertise

3.0 Preamble

Currently, in the O&G sector, the team of experts are mostly those involved in the collection of data and compilation coordination. Reporting is usually carried out by consultants assigned by the DCC. Data collection and compilation coordination are routine processes that pre-date the MRV systems in the O&G sector as it is used for the purpose of industry statistics. This process includes gathering and taking records of data and processing into a format agreed by the DPR. The data collected in the O&G are usually submitted on time based on the guidelines set out by the MPR.

Even though the O&G Industry already has experts on activity data collection, this needs to be constituted properly as part of a robust MRV system for the sector. The capacity of such teams should be built to make them experts not only in their field of operation, data collection and compilation, but also in the complete MRV process ensuring transparency. Methodical guidelines need to be put in place to enhance productivity, efficiency, and transparency of the process.

The team when constituted should also have suitable back-up expertise and access to relevant training materials relevant to the MRV process. This is important because most of the personnel expected to be involved in this process have their operational functions in their various companies and in line with company policies can, be moved, promoted, or withdrawn from their functions within the MRV institutional arrangement. Hence, a succession plan with a back-up team of experts is very crucial for the success of running the MRV process.

Considering the dearth of expertise in some of the MRV key functions, at the early phases of developing institutional arrangements, some of these roles may be contracted out to external support/Consultants who should be mandated to train and mentor the team of sectoral experts. In whichever case, it should be stressed that periodically the sectoral experts may need to bring in support teams from independent or private consultants for various functions including when there are new developments from the international treaties, rules, or guidelines.

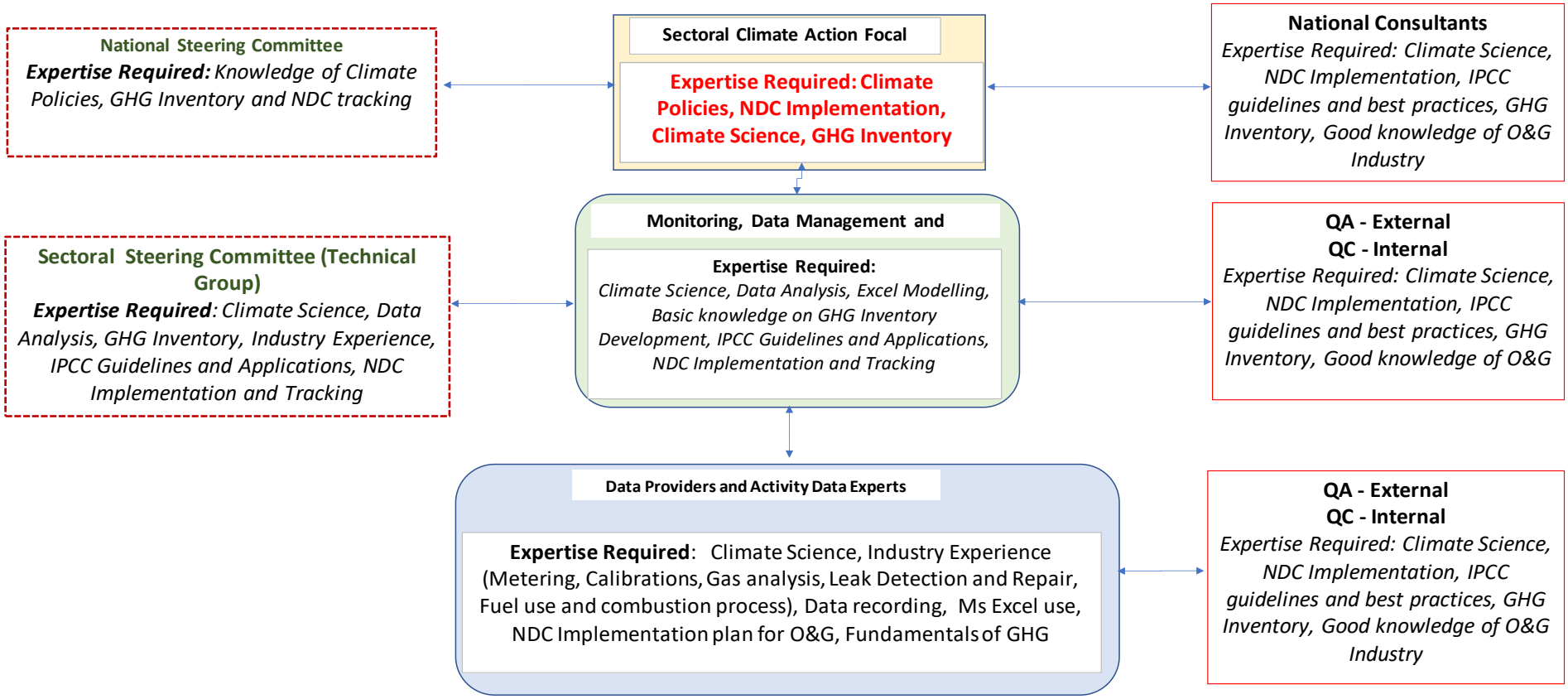
Having a strong team of national experts ensures that expert resources are available to regularly generate technical outputs that inform decision-makers and wider audiences of upcoming challenges, and the country's progress and climate ambition. The team will be responsible for knowledge retention and transfer between experts and organizations, continuous improvement, the smooth succession of national expert roles and training of junior experts.

3.1 GHG Inventory

The GHG Inventory process requires good knowledge of the activity data and the sources, methodologies, tools, guidelines and approaches of estimation, application of IPCC guidelines and other methodologies. The complete team are expected to have good knowledge particularly of the role they are expected to play in the GHG Inventory process (see

Figure 4 below).

Figure 4: Qualifications required by MRV Team for GHG Inventory in O&G Sector



Source: CLN Analysis

The expertise required for a typical MRV process varies from operational experience to a high-level understanding of climate policies as they relate to the sector. From
Figure 4 above, the expertise required is sub-divided into:

- ***Steering Committee, National Focal point, and Monitoring*:** The expertise required at this level principally is that of Climate Policies, sound knowledge of NDC and the implementation plan in the country. The team involved in any of these roles are expected to have a good background in climate science and have a good understanding of the interpretation of the GHG inventories.

- ***Sectoral Steering Committee (Technical Working Group/TWG)*:** Experts at this level are expected to be technically sound with good knowledge of the operational processes in the industry. The team is expected to have strong analytical skills with good knowledge of Microsoft Excel and modelling of data. It is expected that the TWG will be involved in developing GHG Inventory hence should have a good understanding of methodologies particularly IPCC guidelines and its applications.

- ***Data Monitoring, Management and Coordination*:** The expertise required for those to be involved in data monitoring, management and coordination shall include a good understanding and interpretation of the activity data, climate science, GHG inventory, NDC implementation and how to track emission reduction. Experts to be involved in this team should also have a good understanding of Climate policies and the role of the oil and gas sector in achieving the Country's NDC targets.

- ***Data Providers and Activity Data Experts*:** Activity data collection also requires a level of expertise particularly on the knowledge of the data to be collected. Usually, data providers are mostly industry operators and are expected to have sound knowledge of the sector. In addition to the knowledge of the sector, Data providers should understand Climate science including NDC processes and implementation. It is also critical that the team understand how the data shall be utilized for developing GHG inventory.

- ***Quality Control (QC)*:** This is to be carried out at the stakeholder level. A delegated team can be assigned by each industry player with the duty to ensure that all data are collated, and information is maintained in line with specific guideline that is consistent with best practice. The team to be involved in the quality control must have a high-level understanding of both climate change and the O&G sector. The activities of the team include a wide range of activities depending on the category of focus:
    - **Data collection:** shall review the data collection process, calibrations of meters, gas chromatographs, other source measuring equipment used for collating data.
    - **Data coordination, management, and monitoring:** shall be interested in the process of data handling, GHG inventory development process, archiving of data and transmission process to the national focal entity.
    - **The level of the national focal entity**: shall be interested in validating the transparency of the activity data, GHG inventory development process and the submission to the international community to be sure it is in line with standard practices.

It is important to note that the delegated team can be the existing personnel that carry out the usual daily QC in the stakeholder's operation but must be giving the mandate of checking for abnormality in the reported climate related activity data.

- **Quality Assurance:** This on the other hand is not an internal but external function, that should only be undertaken by recognized independent third parties, who may be contracted by industry players (Stakeholders) or the national entity for the purpose of ensuring that all information provided are consistent with the requirements of the ETF in line with the Paris Agreement. In the selection of third-party auditor, it is important to ensure the entity is one whose objectivity as independent quality assurers is guaranteed.

3.2 Mitigation

Mitigation actions in the O&G sector can be implemented by any of the companies in the sector with the potentials for emissions reduction. The experts involved in mitigation activities are expected to have good knowledge of sources of emissions and what constitute mitigation actions. It is also important for the team of experts to understand the methodologies, application of IPCC guidelines, tools, guidelines, and approaches for estimating emission reduction from mitigation actions. The complete team are expected to have good knowledge particularly of the roles they are to play in developing mitigation actions in line with the NDC implementation process.

Mitigation project activities in the O&G Sector include projects that lead to efficient fuel combustion, optimize production processes, reduce gas flaring, fugitive methane emission, venting and other project activities. Estimating emission reductions as a result of mitigation project activities requires knowledge of the baseline scenario. Experts in the O&G Mitigation activities are expected to understand the application of the baseline for each mitigation action type.

The expertise required for the typical MRV process of Mitigation action varies from knowledge of operational experience to a high-level understanding of Climate policies in relation to the O&G Industry. This is similar to the Figure 4 above on GHG Inventory, the expertise required is sub-divided into:

- ***Steering Committee, National Focal point, and Monitoring*:** The expertise required at this level principally is that of Climate Policies, sound knowledge of NDC and the implementation plan in the country. The team involved in any of these roles are expected to have a good background in Climate Science and have a good understanding of analyzing mitigation actions/projects.

- ***Sectoral Steering Committee (Technical working group)*:** Mitigation experts at this level are expected to have sound project management skills with good knowledge of the development of mitigation action projects in the O&G Industry. The team is expected to combine strong analytical skills with good knowledge of the application of Microsoft Excel as well as modelling of the mitigation emission reduction estimation. It is expected that the TWG should have part of their team with a good understanding of how to estimate emission reductions from mitigation projects and should therefore have a good understanding of methodologies and their applications.

- ***Data Monitoring, Management and Coordination*:** The expertise required for those to be involved in project monitoring, management and coordination shall include a good understanding of mitigation projects in O&G, climate science, NDC implementation and how to track emission reduction. Experts to be involved in this team should be familiar with what constitute climate mitigation projects in the oil and gas sector and how it will contribute to achieving the Country's NDC targets.

- ***Data Providers and Activity Data Experts*:** Identifying and analysis of mitigation action projects requires a level of expertise particularly on the knowledge of the data to be collected for each mitigation action. In the O&G sector, activity data for mitigation actions are usually taken either by meters or analyze using Gas Chromatographs. Industry operators designated to these roles should be able to identify relevant monitoring facilities related to estimating emission reduction from all mitigation actions in the sector. In addition to the knowledge of the sector, Data providers should understand NDC processes and implementation.

- ***Quality Control*:** This is carried out at the stakeholder level. The team delegated at the stakeholder level will be involved in monitoring data and validating to ensure that this data meets the minimum requirement for developing mitigation projects at the stage of validation. They are also to be involved in a verification process to work with the external auditors to confirm that the mitigation projects have indeed reduced GHG emissions. It thus implies that the quality control team must have high-level understanding of the Paris Agreement and NDC implementation plan within the O&G sector. The activities of the team shall be similar to those involved in GHG Inventory. The team activities shall include wide range of activities depending on the category of focus:
    - **Data Collection:** focused on the identification of mitigation projects shall validate the mitigation projects, review the calibrations of activity data meters, Gas Chromatograph, other measuring equipment.
    - **Data coordination, management, and monitoring:** shall work with the external auditor to ensure that all mitigation project activities when they are operational have their monitoring in place in line with the ETF requirement and have data that can verified to show that the project is reducing GHG emissions. They will also be focused on monitoring the archiving of the data process.
    - **National focal point**: are expected to ensure a proper check on transparency of all the mitigation action projects that are captured in the National climate registry is done accordingly.

- **Quality Assurance:** This on the other hand is not an internal but external function and should only be undertaken by recognized independent third parties, who may be contracted by industry players (Stakeholders) or the national entity for the purpose of ensuring that all information provided are validated and verified and are consistent with the requirements of the ETF in line with the Paris Agreement. In the selection of third-party auditor, it is important to ensure the entity is one whose objectivity as independent quality assurers is guaranteed.

Box 2: Addition to the O&G MRV System - Expertise

- Going forward, the level of expertise shown in Figure 3 and
- Figure 4 is expected. A guidebook needs to be put in place that defines the experiences expected or need to be acquired for every role in the MRV process.
- The MRV team is expected to include a multi-disciplinary team which shall include experts from various disciplines such as Engineers, Data Analyst, Climate Scientist, Environmentalists, Climate Policy experts, Communication experts and many others as applicable to the Oil and Gas Industry. All the MRV team are expected to be trained periodically on MRV system.

Chapter Four – Data Flows

4.0 Overview

The importance of reliable and regular data flows is essential for well-functioning institutional arrangements required to achieve the objective of an effective MRV system in the sector. Data flows, therefore, include identifying the key datasets both for GHG inventory and mitigation activities that are required and the data providers who are key in ensuring that this data is provided in such a way that it fits the intent for which they are required. Developing a good data flow in the sector will provide insight as to the needs and uses of data, ensure effective management and delivery of datasets by the O&G companies regularly and ensure that data is improved to reduce uncertainty.

For instance, well-functioning data flows in the sector will ensure that data needed to understand the challenges faced on efforts to reduce GHG emission are identified. It is also capable of demonstrating progress made and climate ambition.

4.1 GHG Inventory

Dataset and Data Provider

Developing GHG inventory for the sector is very important as this will play a key role in helping industry experts, decision, and policymakers to understand the primary sources of emissions in the sector.

Since the role of data cannot be overemphasized, this inventory data flow will provide insight on the data that needs to be provided in line with best practice, that is, the 2006 and recent 2019 IPCC Refinement Guidelines for national GHG inventories.

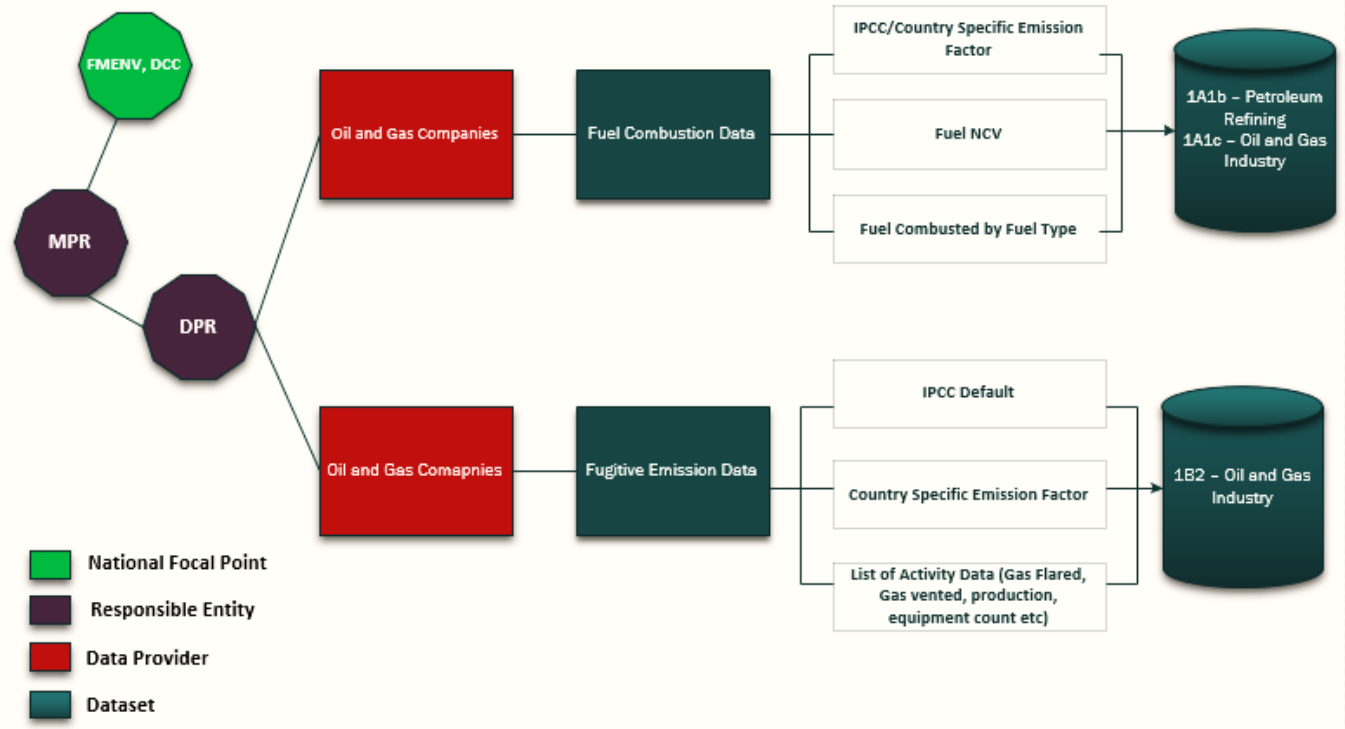
To date, the use of Tier 1, which is mostly based on the use of production statistics and default emission factors which has high levels of uncertainty has been employed in the development of an inventory in the sector, especially for national reporting. However, data collated will need to be disaggregated further to ensure emissions estimates that represent the sector contribution to the overall GHG emissions of the country. Further details on the dataset are discussed in Section 5.1.

Data Flow

Figure 5 below presents the developed GHG inventory data flow for the sector. The data flow on GHG inventory for the sector addresses what the principal data set are, who are the data providers, the key actor mandated with collating this data and how the data is integrated at the national level.

Dataset identified are based on the requirements as per the subcategory in the IPCC guideline that is specified to the sector under energy. The O&G companies are to be intimated on the need to provide more information to move from the current Tier 1 methodological approach to a Tier 2 and/or 3 as appropriate. The DPR as the sector responsible entity must work closely with the oil and gas companies so that they have a clear understanding of what is required as regards inventory data, as this will allow for an improved database on an ongoing basis and further contribute to reducing the uncertainty of GHG inventory at the national level. Further highlights of the relevant data are highlighted in Section 5.1.

Figure 5: Inventory Dataflow for the Sector



Source: CLN Analysis

While there is a mandate that requires that all data pertaining to the sector's operations is forwarded to the DPR, which enables the concept of data sharing and improvement in data quality, there is a need to establish a directive that will necessitate the direct onward transfer of inventory data to the FMEnv, DCC. This will ensure timely delivery of GHG inventory reporting at the national level.

4.2 Mitigation

Dataset and Data Providers

Reducing GHG emissions in the sector is important to achieve the NDC target. Nigeria in its NDC(s) has earmarked two principal areas of focus for achieving its emission targets in the sector. This includes gas flare and fugitive methane emissions reduction. It is imperative to note that data sharing in the sector is currently limited to production data, as there exists no mandate that requires the need to submit an update on climate mitigation data to the responsible entity (DPR). A proposed system that will address this challenge is discussed and provided in section 5.2.

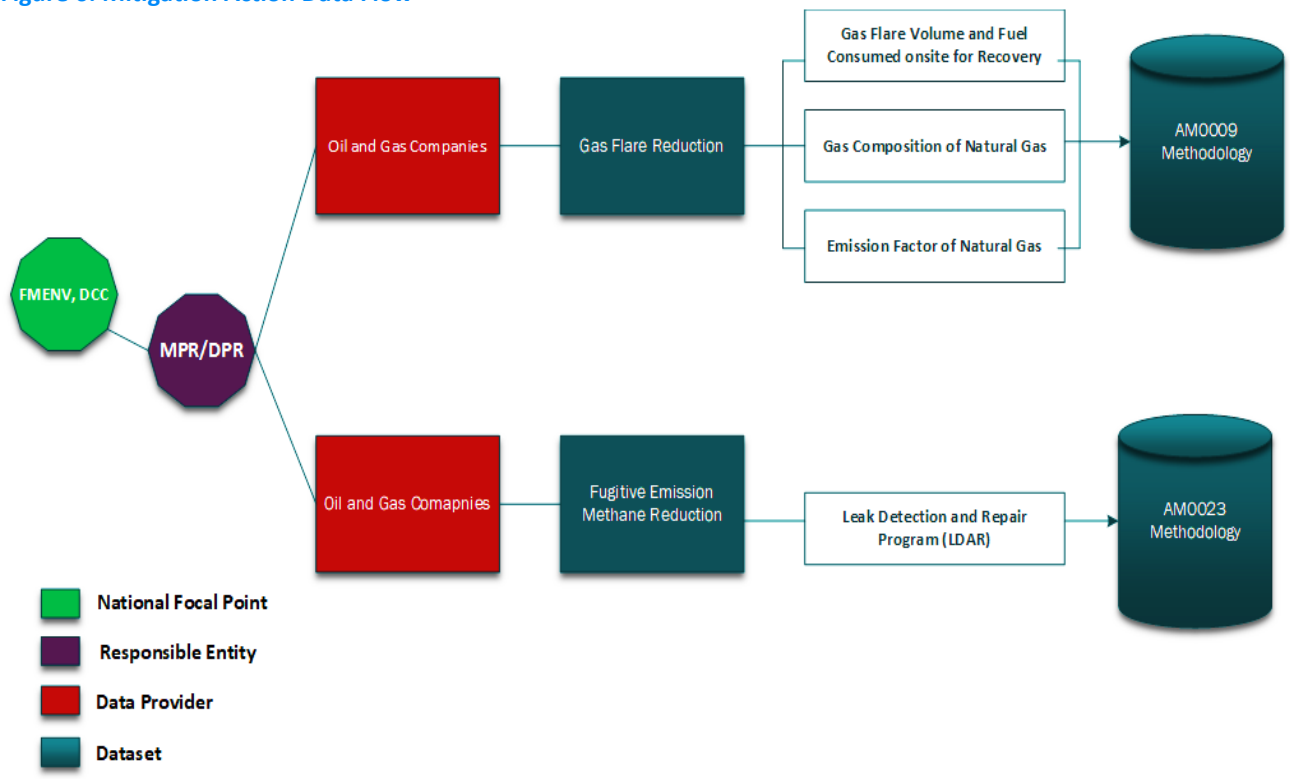
However, it is expected that going forward, the proposed data flow for mitigation action in the sector will allow for effective MRV of mitigation action. It is important to note that, unlike other sectors, the project developed in the oil and gas sector are mainly carried out by the key sector players, that is the oil and gas companies. Previously developed climate project was majorly monitored either as CDM project or developed under other carbon financing mechanism which required prior notification of the national designated authority in the DCC for project registration. Hence, the flow of data regarding the climate project outcome

has not been properly monitored and reported on a sector basis but mostly at the company and global level (UNFCCC).

Key Mitigation Actions

- **Gas flaring:** Ahead of 2030, it has become pertinent for all O&G sector players to accurately reduce and monitor flare gas. This is in line with the directive of the federal government as stated in the Nigeria Gas Flare Commercialization Program (NGFCP) and this implies that players would adhere to all gas flare reduction policies and regulations and with the insight of achieving the 2030 zero flaring target as stated in the NDC. The table below presents data requirements that must be reported for a gas flare reduction project activity.
- **Fugitive Methane:** While policies and regulations for reducing fugitive methane emissions is still a work in progress in Nigeria, the AM0023 CDM methodology provides reporting standards for projects activities that use Leak Detection and Repair (LDAR) to reduce fugitive methane in facility components. It is based on this gap that a data flow that provides insights on the dataset that needs to be collated, the data provider, and the flow of information in the sector has now been developed. Figure 6 below highlights the data flow for mitigation action in the O&G sector.

Figure 6: Mitigation Action Data Flow



Source: CLN Analysis

Dataflow

The delivery of the dataset will be done.

- ***Data Set:*** This refers to the primary data that provides a basic description of the project type, the methodological approach, and the outcome of the mitigation project. A basic template for the data set to be provided is further highlighted in section 5.2 below.
- ***Data Provider:*** These are oil and gas companies that have active operations. Further details have been provided in section 6.
- ***Responsible Entity:*** The DPR is the focal entity for the sector.
- ***National Focal Point:*** The DCC

Box 3: Addition to the O&G MRV System – Data Flow

- There is a need to establish a directive that will necessitate the direct onward transfer of inventory data to the Federal Ministry of Environment, Department of Climate Change. This will ensure timely delivery of GHG inventory reporting at the national level.
- A data flow that provides insights on the dataset that needs to be collated, the data provider, and the flow of information in the sector needs to be put in place.

Chapter Five – Coordination, Systems and Tools

5.0 Overview

Coordination, systems, and tools are very critical to ensure the transparency of the system. These activities include the collection of data, analysis, quality assurance, quality control, summarizing and archiving of data. Institutional arrangements need to provide for the development and maintenance of work plans, engagement tools, databases, data analysis, indicators, and reports (UNFCCC Handbook, 2020).

In the case of the O&G Sector, the coordination process starts at the company level, as it serves as the primary source for data collation. While there exists no specific regulation that requires the submission of climate-related data in the oil and gas industry, it is worth noting that the coordination of data resides with DPR as the sector has in place a regulation that allows the DPR to be the primary custodian of all industry data through the creation of a **national data repository**. This is evident in the National Data Repository Regulations 2020 which provides that:

> "*The repository shall serve as a data centre for the Nigerian Oil and Gas industry and shall provide the platform for timely submission of all oil and gas data and also serves as a digital platform for the DPR to improve the interaction* ***between the Government and the industry***".
>
> National Data Repository Regulation 2020.

Hence, the national data repository needs to be harnessed to accommodate and integrate climate-based related data going forward to support the MRV objective.

Data to be collected is discussed in sections 5.1 and 5.2 and it is expected that the DPR work closely with the companies to ensure the quality of both inventory and mitigation-based data.

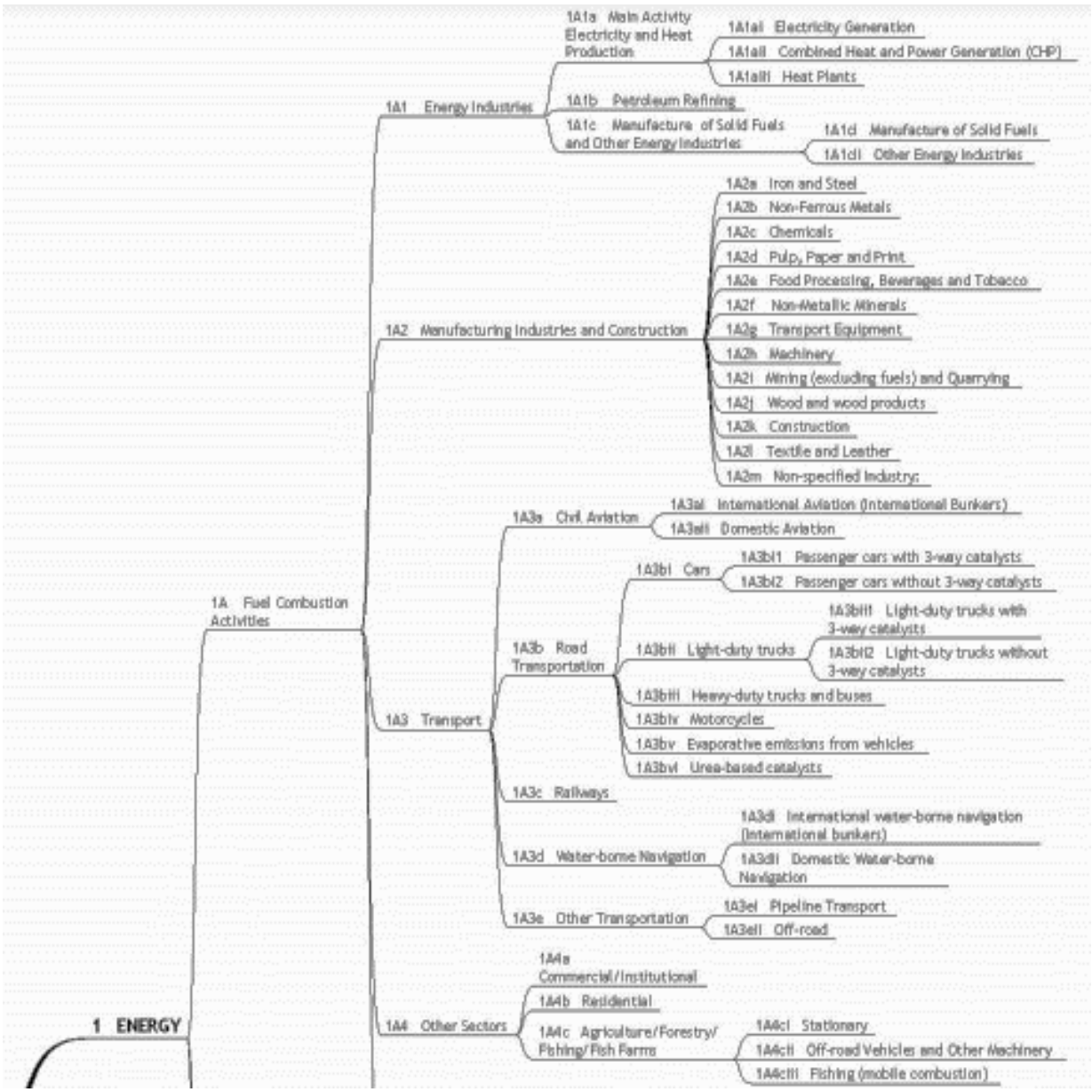
5.1 GHG Inventory

For the sector inventory, source categories are defined in line with the IPCC guideline which is relative to the energy sector. The IPCC guideline describes activities resulting in GHG emissions under each sub-category in the energy sector and provides a method to estimate GHG emissions and sinks (IPCC 2006 and 2019).

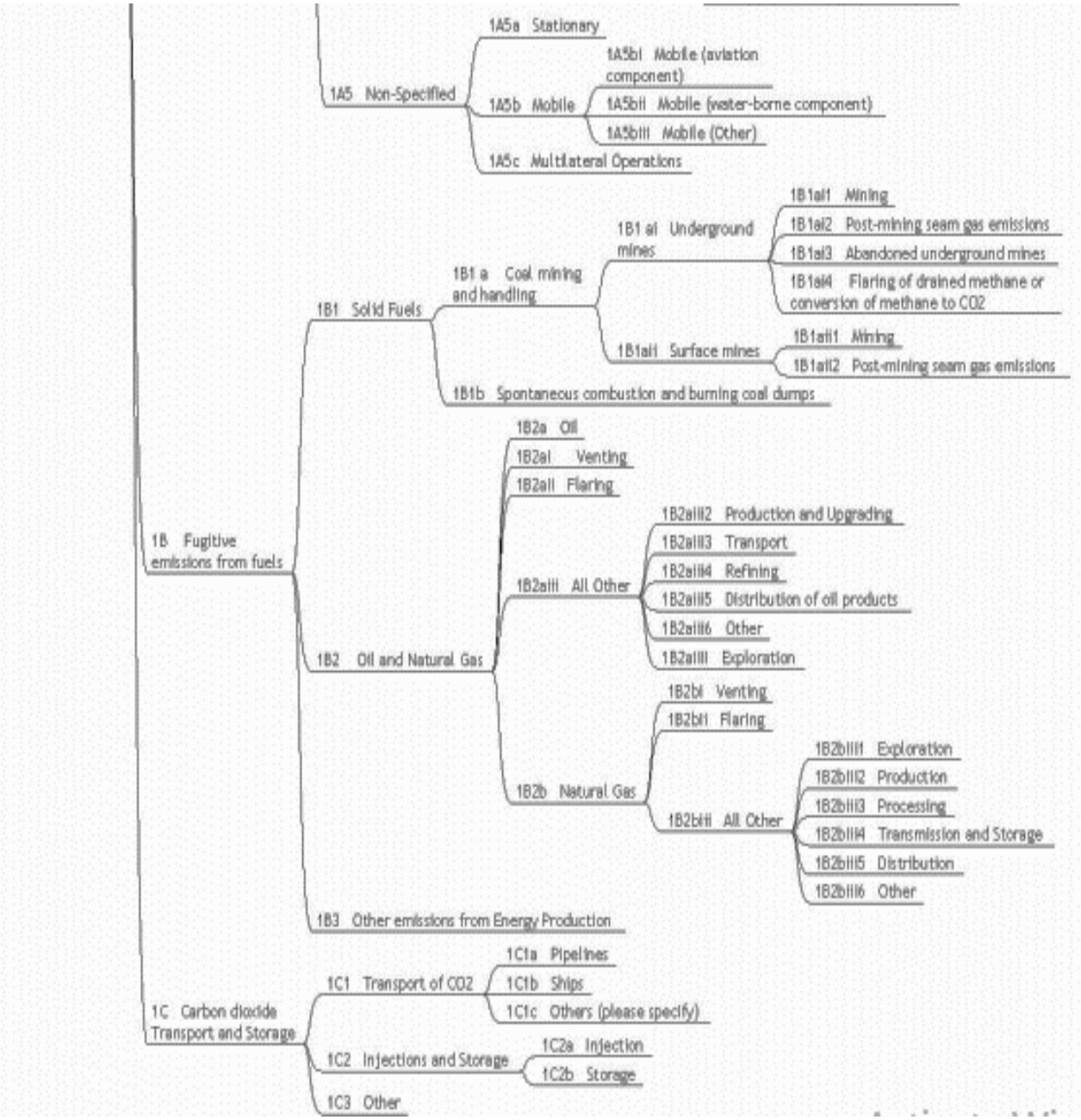
Data Management: The identification of data sources and the collection of identified data is important. To date, most data estimating inventory in the various communication has been based on the adoption of mostly Tier 1. However, going forward, data collated should be targeted with the goal of meeting the requirements for a Tier 2 and 3.

For the top-down methodologies, the GHG effects of energy activities and operations within the sector should align with the IPCC source category with emphasis on the activity data for each fuel type and the country-specific emission factor determined (IPCC 2006, 2019). Table 1 below highlights the relevant category as per the energy sector in the IPCC guidelines with particular emphasis on the relevant sub-sector to the oil and gas sector.

Figure 7: Energy Sector based on IPCC Guidelines



Source: 2006 IPCC Guidelines for National Greenhouse Gas Inventories



Source: 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Table 1: Relevant IPCC 2006/2019 Guidelines sub-sectors under the Oil and Gas sector

Sub-sector	Activity	Relevance to the sector	Data Provider	Responsible Entity Data
1A1a	Main activity, electricity, and heat production	Not relevant	-	-
1A1b	Petroleum Refining	Relevant sub-sector	Oil and Gas Operators	DPR
1A1c	Oil and Gas Industry	Relevant sub-sector	Oil and Gas Operators	DPR
1A2a-1A2m	Manufacturing Industry and Consumption	Not relevant	-	-
1A3a – 1A3e	Transport	Not relevant	-	-
1A4a – 1A4c	Other Sector	Not relevant	-	-
1A5a – 1A5c	Non-Specified	Not relevant	-	-
1B1a – 1B1b	Solid Fuels	Not relevant	-	-
1B2a – 1B2b	Fugitive Emissions from Oil and Natural Gas	Relevant sub-sector	Oil and Gas Operators	DPR
1B3	Other Emissions from Energy Production	Not relevant	-	-
1C1a – 1C3	Carbon Dioxide transport and storage or in future can be re-injected	Not relevant[1]	-	-

Source: IPCC Guidelines and CLN Analysis

There is, therefore, a need for enhancing data collation as this will allow for better estimates for emissions in the sector and further drive the integration of Tiers 2 or 3 approach based on the level of data-by-data providers. This is crucial especially in the estimation for fugitive methane emissions. This is because the estimation gets better with the use of adequate technology such as the LDAR equipment. The report can be made more accurate with the use of measuring equipment which enabled Tier 2 compared to the usual Tier 1 approach in use. This is essential as it will help to reduce uncertainty and improve GHG inventory estimates.

As per the relevant categories, there is a need to enlarge the scope of current data reported by the various data providers. Hence going forward, data that needs to be collected to be able to move to a higher Tier includes but is not limited to the dataset as highlighted in **Tables 2 and 3** below.

[1] Where this is deemed applicable, it should be accounted for in line with the Volume 2, Chapter 5 of the 2006 IPCC guideline.

Table 2: Data for Activity 1A1b and 1A1c

Description
Amount of Fuel Consumed/Combusted by Fuel Type per type of device if possible (i.e., engine, boiler, furnace, etc.)
Composition by Fuel-by-Fuel Type (C content)
Net Calorific Value (NCV) (Heat Content) by Fuel Type

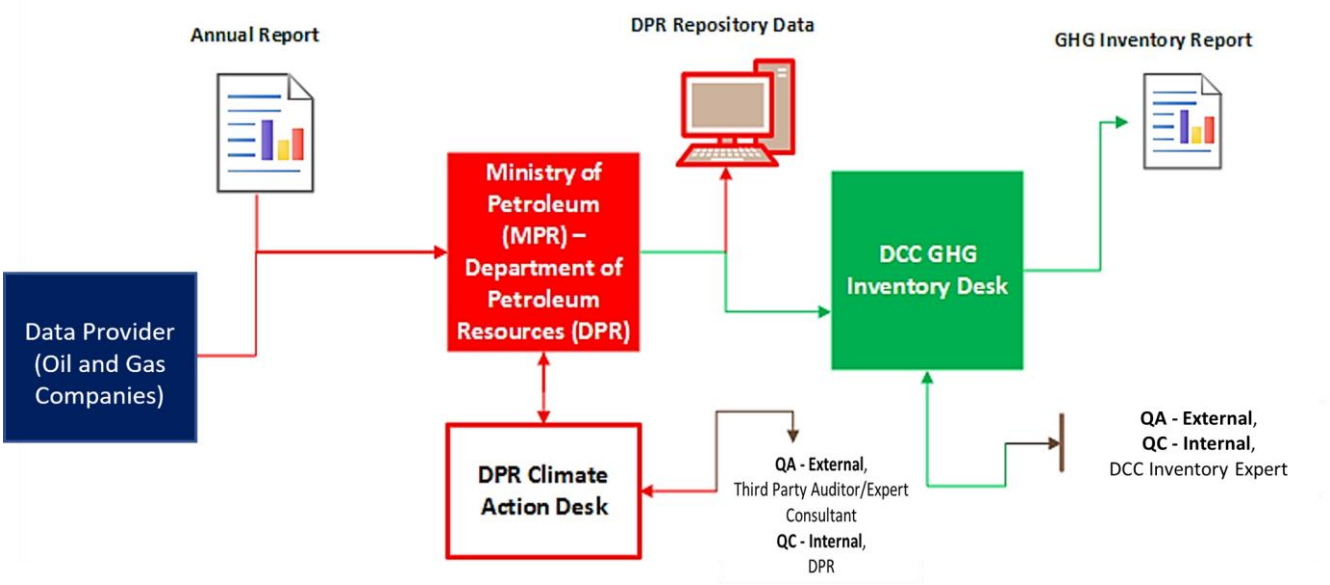
Source: IPCC Guidelines and CLN Analysis

Table 3: Data for Activity 1B2a – 1B2b

Description
Number of tanks per type of hydrocarbon
Number of storage tanks
Number of pumps
Number of controllers
Number of compressors per type of seal (wet/dry/dry with nitrogen loop)
The volume of gas flared
The volume of gas vented
Flare Efficiency
Gas Composition
Gas to Oil Ratio (GOR)
Number of day or hours gas was not flared but vented from the operation
Number of wells with casinghead gas venting
Number of compressors
The volume of gas used for energy production on-site
The volume of gas treated
Number of gas wells
The volume of CO_2 treated
Number of service lines, number of metering and regulating stations
Number of vessels
Number of km of pipes according to diameter category, operating pressure unit, number of facility blowdowns
Facility throughput
Number of days of drilling
Number of wells tested
km length of pipelines

Source: IPCC Guidelines and CLN Analysis

Figure 8: Data Coordination and QA/QC for GHG Inventory



Source: CLN Analysis

Data are to be reported by all O&G companies to the DPR. Currently, the DPR conducts QC of data on a quarterly and an annual basis. Also, it ensures that operators meters are properly calibrated by a third party in the presence of the DPR and the operators. This process is expected to be updated on an ongoing basis to ensure that data provided are in compliance with the sub-sector as specified in the IPCC guideline and the quality of data provided has little or no bias and uncertainty. Going forward it is pertinent that to ensure the quality of data, national experts are engaged to conduct a review and validation before data required for inventory is finally documented. Production statistics, fuel use, and combustion efficiencies for different facility types should be considered for the review. At the review level of the DCC, the objective should be to involve reviewers (third party) who will conduct an unbiased review of the inventory to have a different technical perspective. This review will identify potential gaps and make corrections where necessary. The review must take into consideration all calculations, documentation, and assumptions by experts in the relevant technical fields. After collection and compiling review comments, a final GHG inventory report will be compiled by the national inventory coordinator creating an up-to-date inventory, as appropriate based on comments.

5.2 Mitigation

Mitigation Actions (MA) are actions and processes that aim at reducing GHG emissions. This term is referred to as the main instrument to actuate emissions reductions. To ensure effective coordination and management of mitigation action in the sector, it is imperative to have a well define system that will allow for ensuring effective reporting of all climate action implemented in the sector. Hence, the section focuses on the need to harmonize the process of data collation, the format in which these data are to be collated/reported and how data quality is preserved in the process of data collection and archiving.

Data Collation

Data will be collated at the project level, as developed by the relevant O&G companies. The data to be collated will be based on the project type using the available acceptable methodological approach. The data will be updated on an ongoing basis to assure transparency of reporting in line with international best practices.

Methodological Approach

Aware of the peculiarity of climate action in the sector, discussed below is the type of mitigation action and the basic template for data collation.

- **Gas flaring** – using CDM Methodology AM0009
  This methodology is applicable to project activities that recover and utilize associated gas from oil fields that would have been either vented or flared. The recovery of the associated gas may include pre-treatment (that is compression and phase separation) in mobile or stationary equipment. The data to be provided by the O&G companies as regards gas flare reduction is highlighted in Table 4.

Table 4: Required Gas Flare Reduction Projects Activity Data

Gas Flare Reduction Projects Data	
Project ID	A unique project number assigned
Title of Project	Description of the project to be developed
Project Objective	Description of the objective of the project in line with the sector NDC target
Project Description	
Project cost	
Status of Implementation	Planned / In progress / Implemented
Constraints	
Related NDC target and SDGs	
Related National Strategy(ies)	
Methodology for Mitigation Outcome	AM0009
Applicability	• Applicable to project activity whereby recovered gas is transported to a gas pipeline with or without prior processing. • All recovered gas comes from oil wells that are in operation and are producing oil at the time of the recovery of the associated gas and/or gas-lift gas. • A partial amount of the associated gas and/or gas-lift gas can be used on-site to meet on-site energy demands
Primary Data Requirement	Historical Flaring – 3years

Data and Parameter to be Monitored	• Volume of the total recovered gas measured (VF,y) • Average net calorific value of recovered gas (NCV) • CO_2 emission factor for methane (EF) • Volume of Fuel onsite combustion • Density
Emission Reduction	$ER_y = BE_y - PE_y - LE_y$
Verification	Can be carried out by a Third Party
Action Support	

Source: CDM AM0009 Methodology and CLN Analysis

- **Fugitive Methane** – using CDM Methodology AM0023

  AM0023 methodology is applicable to project activities that reduce leaks in natural gas pipeline compressor stations and gate stations in natural gas long-distance transmission systems. The methodology is also applicable to other surface facilities in gas distribution systems including pressure regulation stations. AM0023 is applied by establishing an advanced LDAR program. The LDAR program is applicable where natural gas pipeline operators have no current systems in place to systematically identify and repair leaks; where leaks can be identified and accurately measured; and where a monitoring system can be put in place to ensure leaks repaired remain repaired. Table 5 highlights the principal data that needs to be provided by the sector player.

Table 5: Basic Template for Fugitive Methane Reduction Project

Fugitive Methane Emission Reduction Data	
Project ID	A unique project number assigned
Title of Project	Description of the project to be developed
Project Objective	Description of the objective of the project in line with the sector NDC target
Project Description	Leak Detection and Repair
Project cost	
Status of Implementation	Planned / In progress / Implemented
Constraints	
Related NDC target and SDGs	
Related National Strategy(ies)	
Methodology for Mitigation Outcome	AM0023

Applicability	• To projects whereby during the last three years prior to the implementation of the project activity, no advanced LDAR program was in place to address physical leakage from components that are included in the project boundary. • New physical leaks that are detected at components during the crediting period (e.g., not at the time the project starts) are accountable only if the components were included in the project boundary at the validation of the project activity. • Physical leaks that need to be repaired due to current regulations and legislation are accountable only if it can be demonstrated that relevant regulations and legislation are not enforced in the country. **Note that this methodology is not applicable to:** • Physical leaks that are detected and repaired under a conventional LDAR program. • Physical leaks can be repaired by tightening/re-greasing or by similar measures. • Physical leaks that are identified on components where the latest scheduled maintenance or replacement was not done before the starting date of project activity as documented through maintenance logs, maintenance schedules, maintenance guidelines, worker logbooks, or other similar sources. • Reductions in process venting. • Reductions in natural gas or refinery gas combustion by process heaters or boilers, engines, and thermal oxidizers.
Primary Data Requirement	
Data and Parameter to be Monitored	Include but not limited to, • The time the components were leaking during the crediting year (Ti,x) • The time (in hours) the relevant component has been leaking during the crediting year (Tz). • Temperature and pressure of natural gas • The time the components would leak in the baseline scenario and would be eligible for crediting during the crediting year (Ti,r) • The uncertainty range for the measurement method applied to the leaks (URj) • Average Mass Fraction in the natural gas/refinery gas for the crediting period

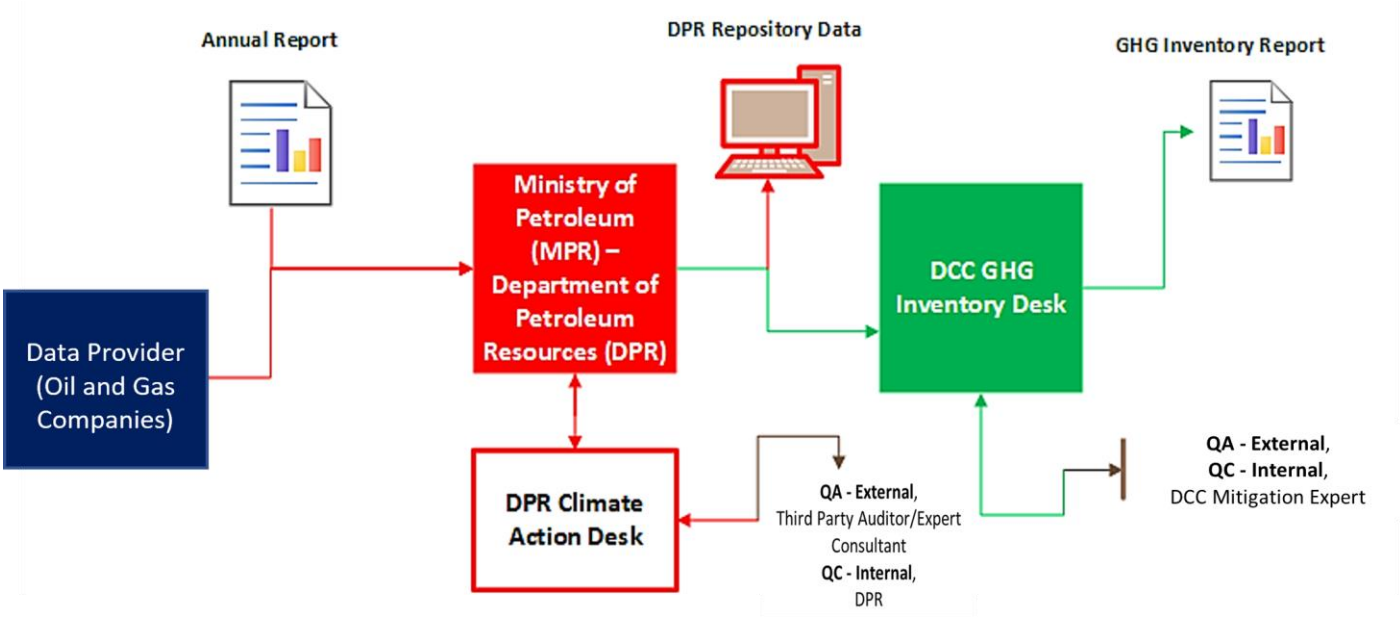
	• The concentration of methane in the sample flow from leak • The leak flow rate of methane • Average bag fill time for leak • Capped quantity of the baseline emissions, defined as the baseline emissions for the first year of the crediting period etc.
Emission Reduction	$ER_y = BE_y - PE_y - LE_y$
Verification	Can be carried out by a Third Party
Action Support	

Source: CDM AM0023 Methodology and CLN Analysis

Data Management

Data collation, summarizing and archiving is to be carried out at the various hierarchical level of data flow (See Figure 9).

Figure 9: Data Coordination and QA/QC for Mitigation Action



Source: CLN Analysis

This level of redundancy of data summarization and archiving (Figure 9 above) will permit quality assurance and control of data to be easy to manage.

At the company level, developing and providing a report on mitigation actions carried out can be done either internally if capacity is already built or in cases where this is lacking, use of consultants may be employed by the company at the initial stage. Further, mitigation outcomes to be reported must be properly verified to ascertain reduction claims and reduce uncertainty. The mitigation action report to be provided must be maintained in a reporting template that allows for ease of exchange of data between the DPR and the DCC.

A climate mitigation desk should be created in DPR with the sole purpose of reviewing, validating, and verifying all relevant climate-based mitigation project data submitted before been finalized for upload in the national repository. Since the DCC, already have a database that allows for archiving NDC climate action project data, all submitted projects should be transmitted to the DCC.

To further ensure effective coordination in the sector, the capacity of experts involved in the MRV of mitigation process particularly at the highest level will need to be built such that as they have access to the data they can manage the data flow, perform QC, and produce a timely report of a sufficient quality that improves over time. As the mandate of DPR allows it to manage O&G data on behalf of the MPR, it should be able to facilitate engagements with a wide range of stakeholders who provide the mitigation-based data.

Validation and Verification

The process of project Validation and Verification is an important aspect of every project activity. As mentioned above, Validation involves the independent evaluation of a project activity against the project requirements. It is based on the project's design documentation which reflects the project's baseline, monitoring plan and compliance with relevant UNFCCC and host party criteria. Verification on the other hand involves a periodic review and ex-post determination of the monitored GHG emissions reductions that have occurred as a result of a registered project activity.

Validation and Verification processes in the sector should be conducted by third-party verifiers or by an external entity to conduct the QA. All data must be in line with best practice requirements (e.g., International Organization for Standardization (ISO), World Research Institute (WRI), and the CDM). Adequate capacity building would ensure that the stakeholders are fully involved and have a good understanding of the processes involved in the validation and verification tasks.

Box 4: Addition to Existing Institutional Arrangement

- There is a need for enhancing data collation as this will allow for better estimates for emissions in the sector and further drive the integration of Tiers 2 or 3 approach based on the level of data-by-data providers.
- There is need to enlarge scope of current data reported by various data providers. Quality of data going forward should be such that improves the reporting to a higher Tier.
- Going forward it is pertinent that to ensure quality data, national experts/consultants are engaged to conduct a review and validation before data required for inventory is finally documented.
- There should be review at the DCC level, the objective should be to involve reviewers (internal or third party) who will conduct unbiased review of the inventory on the technical perspective. This review will identify potential gaps and make corrections where necessary. The review must take into consideration all calculations, documentation, and assumptions by experts in the relevant technical fields.
- To ensure effective coordination and management of mitigation action in the sector, it is imperative to have a well define system that will allow for ensuring effective reporting of all climate action implemented in the sector.
- Need to harmonize the process of data collation, the format in which these data are to be collated/reported and how data quality is preserved in the process of data collection and archiving.
- A climate mitigation desk should be created in DPR with the purpose of reviewing, validating, and verifying all relevant climate-based mitigation project data submitted before been finalized for uploaded in the national repository.
- To further ensure the effective coordination in the sector, the capacity of experts involved in the MRV of mitigation process particularly at the highest level will need to be built.

Chapter Six – Stakeholders' Engagement

6.0 Overview

The Nigerian O&G sector has several stakeholders with various roles and responsibilities that keeps the sector functional. The MPR represents the overall authority of the sector, while the DPR and NNPC reports their activities to the Ministry of Petroleum Resources. While NNPC stands as a corporate agency and an operator representing the interest of the Nigerian government, DPR on the other hand is a regulatory body for the sector and a department of MPR empowered to set guidelines, regulate, and advise the government on the O&G sector. Table 6 below, shows the key Stakeholders and their engagement/responsibilities in the Nigerian O&G sector.

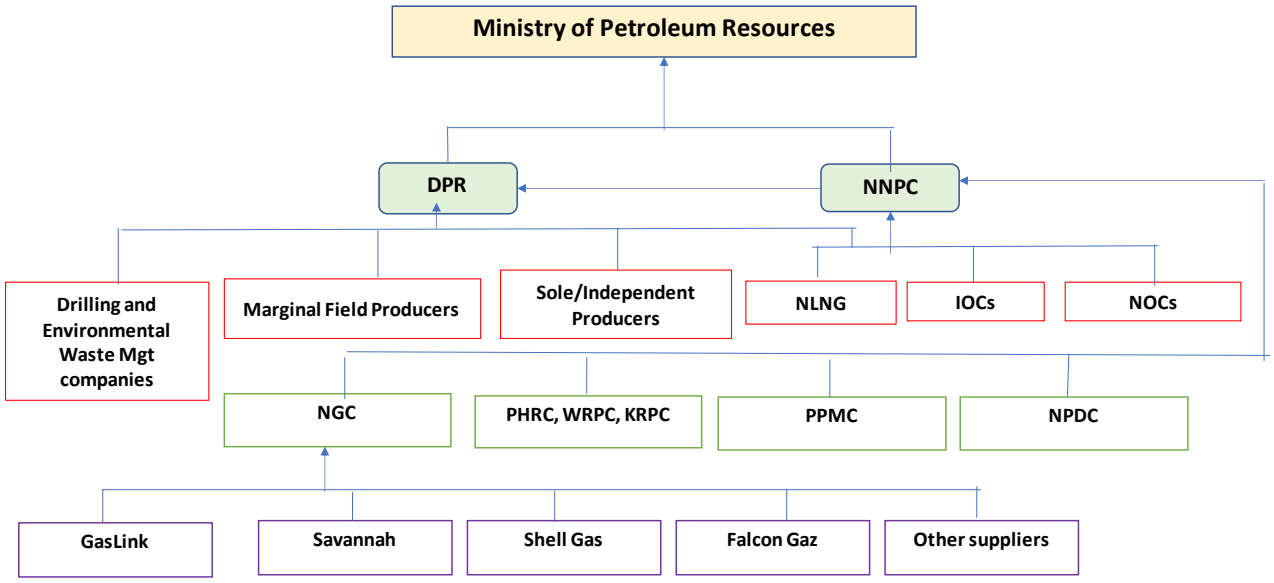
Table 6: Key Stakeholders and their Responsibilities in the Nigerian Oil and Gas sector

Key Stakeholders	Responsibilities
Ministry of Petroleum Resources (MPR)	• Overarching authority for the O&G sector. • Articulates, implements, and regulates policies within the sector. • Exercises a supervisory role over the operators and stakeholders, ensuring compliance with all applicable laws and regulations in the O&G sector.
Department of Petroleum Resources (DPR)	• Statutory responsibility of ensuring compliance to O&G sectoral laws, regulations, and guidelines. • Monitors the petroleum industry operations to ensure compliance with national goals and aspirations to reduce gas flaring and ensure other gas obligations. • Involve in the reconciliation and coordination of records of gas production, flare gas, routine, or operational flare volumes and maintains records on petroleum industry operations.
Nigeria National Petroleum Corporation (NNPC)	• The corporation is responsible for providing data on emissions from their strategies business units and divisions. It also acts as a project implementer. • Through the NNPC-RED, it manages and screens mitigation projects across its strategies business units and divisions. • It is the corporation through which the Federal Government of Nigeria participates in the country's petroleum industry, functioning as an operator and a player across the value chain.
International Oil Companies (IOCs)	• These are international O&G companies operating in Nigeria, they include Western oil giants like Royal Dutch Shell, Exxon Mobil, Chevron, TOTAL etc. • They are the largest producers of crude in the country with operations onshore, swamps and offshore. • Most of these companies are joint venture partners with the Nigeria state -owned company, NNPC.
National Oil Companies (NOCs)	• These are independent and indigenous O&G companies operating within the country. • NOCs represent state-owned oil companies such as NNPC, NPDC etc. • Other NOCs include those in partnership with the National company in a joint venture agreement and they include Seplat, Aiteo, Neconde Energy, New cross Exploration & Production etc.
Marginal Field Producers (MFP)	• These are companies assigned to marginal fields from oil blocks considered to have low production output, they include Midwestern Petroleum, Platform Petroleum, Energia Petroleum among a host of others. • The growth of marginal players has brought a boost to the reduction of gas flaring in Nigeria, with several Nigerian marginal fields recognized under the United Nation's (UN) CDM Programme for their successful reduction of flaring and valorization of natural gas.

Independent Producers	• Independent oil companies or producers in most cases focuses on only one aspect of the sector i.e., either the upstream, midstream, or downstream aspect. Aiteo, Folawiyo, Lekoil are an example of independent indigenous Nigerian companies.
Drilling and Environmental Waste Management Companies	• These are companies involve in the treatment and disposal of oil-based mud (OBM) and water-based mud (WBM) from the oil drilling activities. They include Frigate, Allman global services
Nigerian Liquified Natural Gas (NLNG)	• This is a joint venture incorporated to harness Nigeria's vast natural gas resources and produce LNG and natural gas liquid for export. NLNG powers more than 200,000 houses from the natural gas harnessed.

Source: CLN Analysis

Figure 10: Existing Relationship within stakeholders in the Oil and Gas Sector



Source: CLN Analysis

Figure 10 above shows the existing relationship between the key stakeholders of the O&G sector. The Institutional arrangement is important in the development of an MRV, giving cognizance to GHG inventory and mitigation action. The apex of the O&G sector is the MPR. DPR coordinates industry practices of the stakeholders and reports directly to the Ministry.

6.1 GHG Inventory

With the Ministry of Petroleum resources sitting as the overarching body of the sector and DPR coordinating and aggregating data for the Ministry, data for GHG inventory is extrapolated from the data it received from the industry players. DPR serves as a regulator and the custodian of all data, where inventories of emissions are sent to by all other stakeholders and operators (IOCs, NOCs, Marginal Field producers, sole/independent producers and drilling and environmental waste management companies) including strategic business units and divisions of the NNPC. The data are then collated and sent to the MPR, where it is archived.

However, gaps have been identified in the reporting format of these data as well as in the QA/QC procedures. Since DPR is saddled with the sole responsibility of collating all emission data, it is pertinent to enhance the data quality by putting the following into practice:

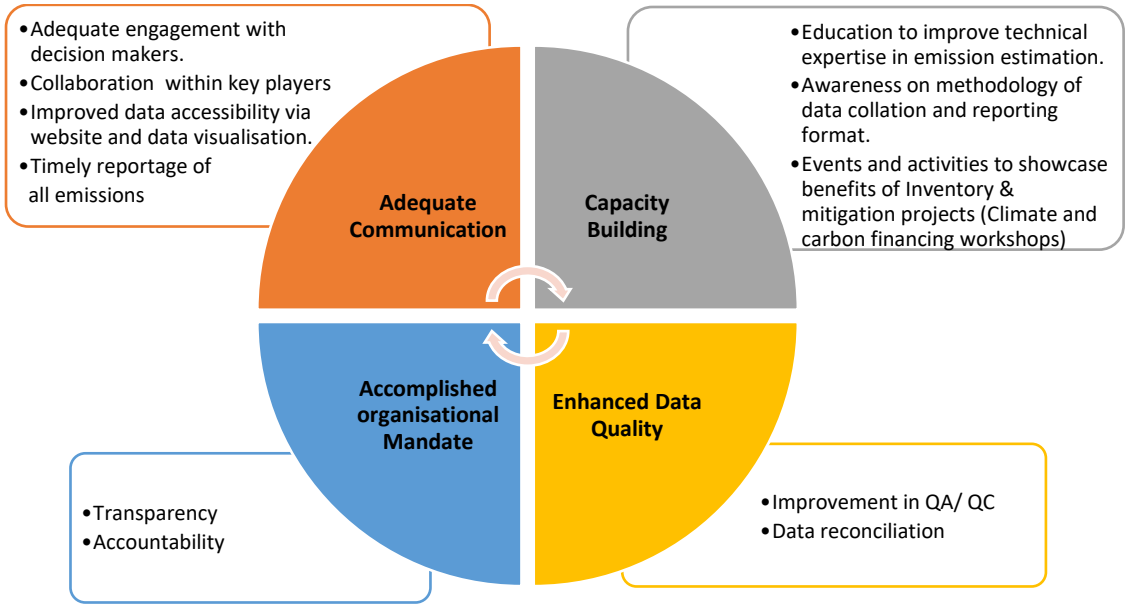
- Adequate data reconciliation and verification employing a third party or external consultants.
- Adequate communication and capacity building through workshops and trainings to enhance knowledge in the application of the methodologies for preparing GHG inventories.
- In house capacity building to improve familiarization with the IPCC inventory guidelines.

6.2 Mitigation

DPR usually is carried along on all projects including mitigation action projects. It often approves the implementation of mitigation projects within the O&G sector especially as it relates to flare down project activities. DPR plays a major role in monitoring the petroleum industry operations to ensure compliance with national goals and aspirations of reducing gas flaring and ensuring other gas obligations. However, in developing a robust MRV framework for the O&G sector the following should be considered:

- There should be profiling of all mitigation actions embarked upon by relevant stakeholders and this can be achieved by creating a Mitigation Action Registry at the desk of the DPR.
- There should be adequate communication to identify mitigation projects and new techniques/technologies for developing the activities.
- Capacity-building should be enhanced to create awareness of the benefits inherent in developing these projects and opportunities/support for financing these activities.

Figure 11: Categories in Stakeholders Engagement in Developing an MRV Framework for the O & G Sector



Source: CLN Analysis

Moving towards an articulated MRV for the O&G sector, Figure 11 above describes the various actions necessary to engage stakeholders to improve the GHG inventory and mitigation actions. The identified key

stakeholders as shown in Table 6 above should be properly engaged through adequate communication and capacity building to enhance data collection and accomplish the organizational mandates. The two upper quadrant and their parameters *(adequate communication and capacity building*) are the categories to be fulfilled to achieve the two-lower quadrant and their parameters (*accomplished organizational mandate and enhanced data quality*).

The first quadrant explains that adequate communication is a prerequisite for Stakeholders' Engagement in developing an MRV Framework for the O&G Sector. This is achievable through engagement and regular briefings on data collection techniques, GHG inventorization and mitigation actions. Collaborating with key players is important in disseminating vital information for capacity building and improvement in data accessibility. This can also be enhanced through website and data visualization in form of a Registry at the level of the DPR, that will focus solely on profiling emissions and mitigation projects in the O&G sector. This will ensure transparency and accountability of emissions. Finally, the timely reportage of all kinds of emissions is necessary for ensuring good stewardship and integrity of the company or facility.

The second quadrant shows that capacity building is equally important for Stakeholders' engagement in developing an MRV Framework. The capacity building could be realized by educating the operators to improve technical expertise in various components of the MRV system, creating awareness on the improved methodology of data collation and reporting format amongst stakeholders. These trainings and capacity building sessions could be made in-house or by consultants (nationally or internationally). It is also important that events and activities such as workshops and trainings on Climate and carbon financing showcasing benefits of Inventory & mitigation projects organized in-country and out-country should be made known to the stakeholders.

The third quadrant, focused on achieving enhanced data quality can be made possible by improving the QA/ QC procedure and data reconciliation. Particularly, it is recommended that a third-party consultant should carry out the QA/QC process of data, validation, and verification exercise of mitigation actions to improve the transparency of these processes.

The last quadrant is an accomplished organizational mandate, and this is achievable when the first three quadrants are in place. The accomplished mandate points at reduction of the carbon emission and as such realizing the NDC mandate will result in transparency and accountability, which forms the basis of an MRV.

Box 5: Addition to MRV System – Stakeholders' Engagement

It is pertinent to enhance the quality of data by putting the following into practice:

- Adequate data reconciliation and verification process by employing a third party or consultant.
- Improved communication and capacity building through workshop and training to enhance knowledge in the application of the methodologies for preparing GHG inventories.
- Capacity building to improve familiarization with the IPCC inventory guidelines, implementation techniques of mitigation activities and support opportunities for financing such projects
- There should be profiling of all mitigation actions embarked upon by stakeholders in a Mitigation Action Registry (MAR) at the DPR.

Chapter Seven – Institutional Arrangements

7.0 Organizational Structure of Institutional Arrangements

The institutional arrangements are a key aspect of building a sustainable MRV system. Having a reliable and sustainable MRV system will involve the regular collection of data, analyzing the data and other useful reliable information on climate action and support to reduce GHG emissions and increase resilience, and data on GHG emission trends. However, to gather and report this information on either a biennial basis, or more frequently for other national needs, there is need for appropriate institutional arrangements.

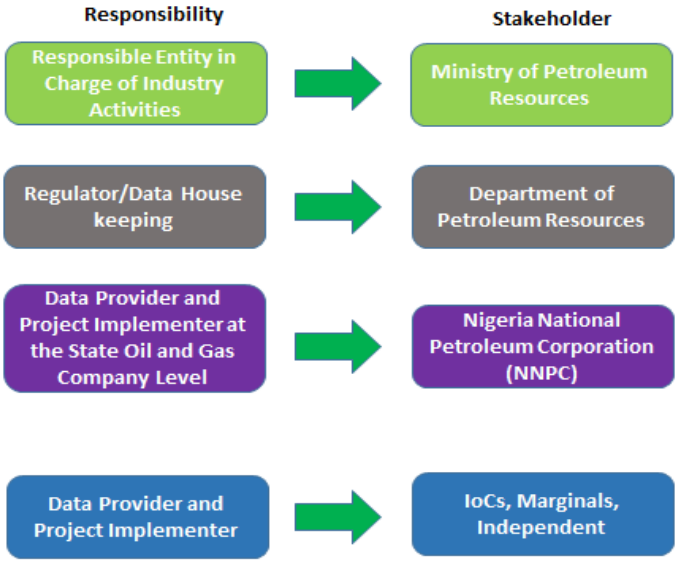
The Institutional arrangements in the O&G sector are peculiar due to the prevailing national circumstances which require high levels of accountability. The industry prioritizes communication of actions and stakeholder's engagement particularly in the implementation of actions. Considering the government interest to ensure accountability as much as possible, the organizational structure is simple with the department of DPR responsible for several objectives and outputs.

Existing O&G Institutional Set-Up

The sector's existing institutional set-up comprises all the companies in the sector, the regulator and focal sector MRV entity, and the national focal point.

- *Oil & Gas Companies:* Major players, NNPC, IOCs (marginal and the Independent).
- *Regulator and Focal Sector MRV Entity*: Department of Petroleum Resources
- *National Focal Point:* Federal Ministry of Environment, Department of Climate Change

Figure 12: O&G Sector Stakeholders and Responsibilities



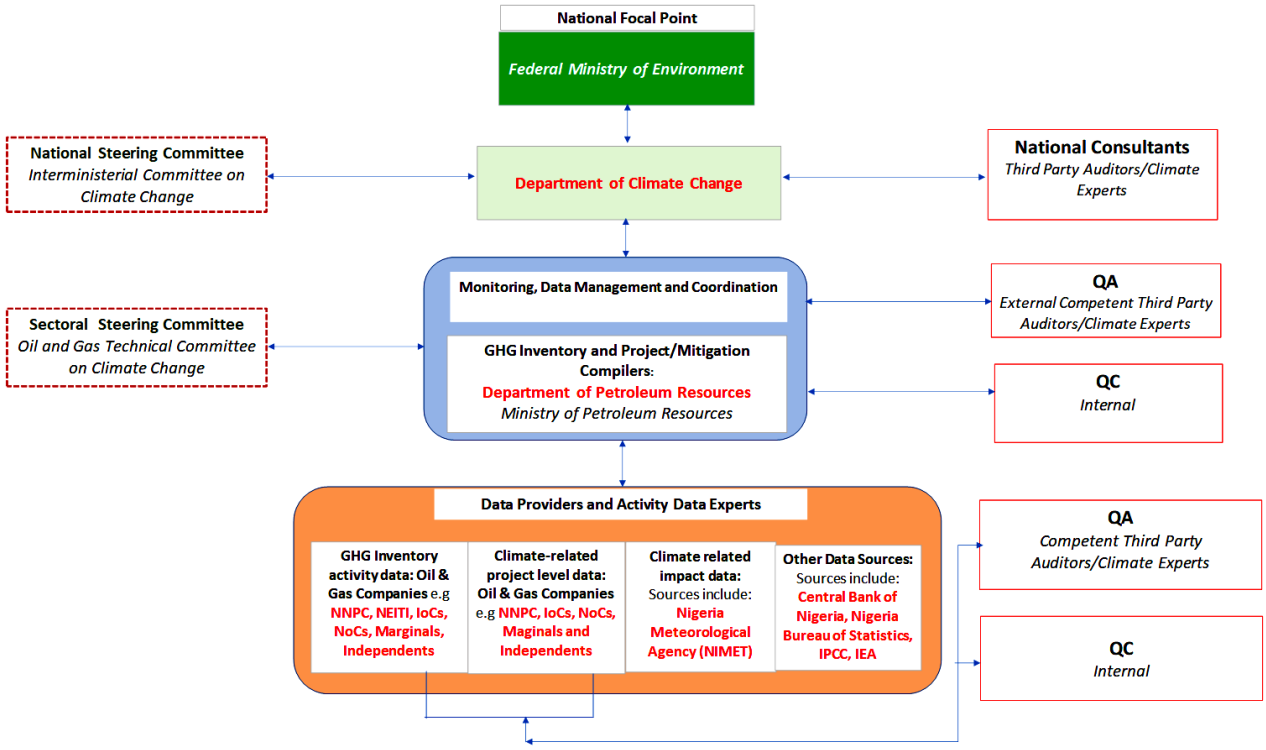
Source: CLN Analysis

Institutional arrangements in the O&G sector are structured and defined with comprehensible roles and responsibilities among the involved organizations. The structure of the institutional arrangements, as shown

in the organization chart in Figure 13, below offers a visual summary of the organizational linkages. The structure reflects the cross-cutting nature of managing the data gathering, analyses, compilation, quality assurance and control, reporting and use of data across the structure.

The proposed institutional arrangements for the O&G sector are designed to articulate the overarching climate goals and targets, and the transparency outputs needed to track them. It is structured such as to capture and prioritize relevant data, expertise and organizations involved. It will also ensure that all the institutions involved understand how transparency activities interact with their mandates and other national development priorities[i]. Another parameter put into consideration in the arrangement includes clarity in communicating data information among the relevant stakeholders. As part of the mid-term expectation is a legal binding document to support the role of the custodian of data and an external entity performing the role of the QA/QC.

Figure 13: Proposed Institutional Arrangement for O&G Sector



Source: CLN Analysis

In Figure 13, there are common roles and responsibilities among the stakeholders. The structure focuses on how data is collected, validated and reported within the institutional arrangement. It should be clarified that the organizational structure is defined by the roles and responsibilities in a manner that helps to comprehend how the MRV process is communicated as well as the functional position of the various organizations in a transparent manner. The organizational structure includes the National focal point, Steering committee (National and at Sectoral level), Management and Coordination, Quality Assurance, Quality Control and Data Providers. All these institutions are largely in place except for the steering committee at the sectoral level, and the QA/QC team.

The roles and functions of the various institutions are as defined below:

National focal point: The institutional arrangements in Nigeria provide for the national focal point as the DCC under the Federal Ministry of Environment. They serve as the key link to the Federal Government of Nigeria and the intergovernmental process and the international community. As the national focal point, they represent the country for all international engagements on climate reporting. All responses expected of the nation as regards climate change, national communications and reporting is handled by DCC. As part of the roles, they have been playing, they collect the data including for P&M, compile the inventory (makes the calculations). The DCC ensure that outputs from the country are prepared and are of sufficient quality to meet the country's commitments. This task is usually carried out by reputable Consultants and supervised by DCC.

Steering committee: Currently, there exists an inter-ministerial body on Climate Change at the national level that has the responsibility to review activities on Climate Change. The committee comprises representatives' national ministries from the NDC sectors and other Departments as well as agencies relevant to the Climate Change activities. The committee collaborates and shares ideas around climate actions, challenges, and actions. While the committee is not noted to be very visible, it is expected that they are involved in a broad range of stakeholders' collaboration on nationally important cross-sectoral strategies. A similar steering committee is envisaged to be formed at the O&G sectoral level whose focus shall be on low GHG emissions development within the sector. The committee should consist of senior representatives and techno-economic subject matter experts of institutions within the sector who are capable of influencing decisions to implement climate action (e.g., technical, corporate planning and strategy, Costing and Health, Safety and Environment (HSE) team from DPR, NESREA, NOSDRA, NNPC and representatives of the IOCs, NOCs, and other companies). It is expected that the committee will be supported by a strong and highly competent secretariat in the MPR for ease of coordination and the setting of agendas. The secretariat shall have the responsibility of assuring transparency of information sharing and decision making.

Management and coordination: The designated organization/agency that coordinates the data gathering, tracking improvements to the transparency system, facilitating legal arrangements for data supply, day-to-day maintenance of data management platforms, and ensuring that cross-cutting links across transparency themes are recognized and developed is the DPR under the MPR. While DPR focuses more on the technical part of the activities, as part of improving the system, it will be required that it also takes on responsibility for monitoring top-down finance and support from international and national sources of climate finance to ensure transparency in the system. It will also assist in addressing institutional needs. The goal of empowering the institutional responsibilities of DPR shall be to ensure the centralized flow of information and efficient coordination of fund management and accountability for the support received and still needed.

Other institutions are expected to serve under the quality assurance and control to ensure transparency of the work, such as:

***National institution or agency*:** National institutions such as the Energy Commission of Nigeria may also be saddled with the responsibility of assessment of the quality of activity data and provision of training as well as capacity building. As an institution it could add to its already known mandate activities such as the provision of technical support and analysis to government officials for decision-making at a national level.

***A private company or Academicians from University*:** The management and coordination of quality assurance and control going forward should be contractually delegated to a reputable organization outside the

government, such as a university, research institute, consultancy firm or private company. This is important to ensure that no institution takes responsibility for data management as well as the quality assurance and control services. The selection process for such an organization should be based on a reputation for integrity, profiling of their technical competency and capacity to coordinate the activities and expertise for the review and assessment of the necessary data and information. It would be ideal to have such Consultants/ Universities /Institute engaged based on a well-defined deliverables and objectives over a 5-year cycle in line with the NDC submission to the United Nations. This will promote sustainable development and capacity building within the sector. Such contracts should be clearly defined and guidelines on the responsibilities of the vendor organization and the client in this case; the government agency, should be made public for transparency and fairness. While this role is with the O&G sector, the contracted organizations should consult the national focal point (DCC) and other relevant offices/staff (O&G Steering committee secretariat) on a regular basis to ensure that the expectations from the international institution such as UNFCCC, and national interest is prioritized and put into consideration always.

As part of transparency in the system, the archiving process for data should be made available at various levels which include at the collection point in DPR as well as the DCC level. The process for estimating for the purpose of GHG Inventory and Mitigation should be communicated to all stakeholders with methodology clearly stated. As part of what needs to be in the MRV framework for the O&G; there should be provisions in place for the transfer of data, methodology documents for calculation and reporting tools as well as guidelines on responsibilities across the institutional arrangement with provisions for adequate training and capacity building.

***Data providers*:** Data providers are already clearly established in the mandate that sets up DPR. All stakeholders in the O&G across the value chain are expected to report to DPR. This includes:

- International Oil Companies (IOCs) such as Chevron, Exxon Mobil, Shell, TOTAL etc.
- National Oil Companies such as Seplat Petroleum, Newcross Exploration & Production, Neconde, Eroton Exploration and Production etc.
- Marginal field Companies such as Midwestern, Platform Petroleum, Energia, Corus Petroleum etc.
- Independent Companies such as Folawiyo Petroleum, Lekoil, Aiteo etc.
- NNPC Subsidiaries such as Nigerian Petroleum Development Company (NPDC), Nigeria Gas Company (NGC), Pipeline and Petroleum Marketing Company (PPMC), Refineries (Kaduna, Warri, and Port Harcourt)

Team Composition: It should be noted that data received by DPR comes from all stakeholder companies though not all data are used for GHG Inventory or Mitigation action. Data collected by DPR are not necessarily for the purpose of GHG Inventory and Mitigation only. As part of ensuring that data collected for MRV purposes is done by expert/ team who are familiar with the data and has the technical skills and knowledge to improve and enhance the data collection, the capacity and knowledge of such team needs to be enhanced through training programmes related to MRV and Climate issues. Data collected are expected to be transparent, consistent, and continuously reported to support calculations and analyses required to inform decision-making and reporting on climate action in the O&G Sector.

Establishing legal frameworks: There are some actions planned into the Institutional arrangement to ensure a robust MRV system for the O&G sector. As part of ensuring a mandate is put in place, there may be a need to establish a legal framework for activities not in place. For example, the Steering Committee at the level of DPR, the QA/QC levels and composition may need to be created. It is important to stress that the institutional arrangements require legally binding frameworks and mandates particularly for those not in existence before now. These frameworks will formalize the new roles, responsibilities, resources, and relationships needed to deliver the transparency system outputs. Currently, there are some legal frameworks in existence for example, the mandate for DPR, NNPC within the MPR. It is however important to also mention that beyond having new mandates, the existing frameworks need to be updated and complemented to ensure sufficient data and resources are available to establish a fully functioning transparency system that can deliver its outputs.

Box 6: Addition to Existing Institutional Arrangement

- *Steering Committee at Sectoral Level (Technical Working Group -TWG):* a functional steering committee is required at the sectoral level as much as it is relevant also at the national level. This is team of technical experts across the Stakeholders in the Sector. Usually, the TWG can be supported by a team of consultants who will work with the TWG team to develop the GHG Inventory model or estimation of GHG reduction as a result of mitigation actions.
- *Quality Assurance and Control:* The quality assurance is expected to be independent third-party Consultants or Auditors with competence to review the data and process of GHG inventory or mitigation action emission reduction estimation while the Quality control is expected to be handled internally. This is expected at all levels from the Focal entity for the country down through the Data coordination and management to the data collection. The QC at the level of data collection could include the Experts on calibration for fuel meters, Gas Chromatograph equipment and any other measuring device used in the O&G industry.
    - It is also important to have a proper guideline for those who can be Auditors or participate in the Quality assurance process.

Chapter Eight – Work Plan, Road Map and Conclusion

8.1 Work Plan

Implementing the MRV framework in the O&G Sector will not be possible within the short term. A work plan needs to be put together which will serve as a guide to the decision-makers as well as other stakeholders in the O&G sector. The work plan envisages that all the new structures proposed in the MRV system as stated in the boxes in chapters 2 – 7 shall be implemented in phases. The matrix below itemizes these actions and the proposed time when they should be implemented.

Table 7: Actions and the proposed time

S/N	Components	Actions Required	Timeline

1	Organizational mandates	• It is recommended that to enhance the transparency framework, a mandate should be given to DPR and other stakeholders to hire an external/third-party verifier who will be responsible for the processes of data verification and validation.
		• Clarity on the mandate that will ensure transparency on the data supply agreement. The agreement should specify one or more of the following obligation types:
		  ○ *Data supply obligations:* This should describe the data provider's obligation stating the type of data to provide in accordance with specific quality and temporal constraints.
		  ○ *Disclosure issues:* These include data protection, data usage, and restriction obligations.
		• Put in place a mandate that obliges DPR to send collated inventory data from the stakeholders and data providers to the DCC who oversees the national GHG inventories.
			2022 - 2023

2	Expertise	• Going forward, the level of expertise shown in Figure 3 and • Figure **4** should be implemented. • A guidebook needs to be put in place that defines the experiences expected or need to be acquired for every role in the MRV process. • The MRV team is expected to include a multi-disciplinary team which shall include experts from various disciplines. • All the MRV teams are expected to be trained periodically on the MRV system.	2022 - 2023
3	Data Flows	• A data flow that provides insights on the dataset that needs to be collated, the data provider, and the flow of information in the sector needs to be put in place.	2022 - 2023
4	Coordination, Systems & Tools	• Enhancing data collation to allow better estimates for emissions in the sector and further drive the integration of Tier 2 or 3 approaches based on the level and quality of data-by-data providers. • Enlarge the scope of current data reported by various data providers to improve reporting to a higher Tier • National experts/consultants to be profiled and engaged to conduct a review and validation before data required for inventory is finally documented.	2022 - 2024

		• The review process at the DCC level involves reviewers (internal or third party) who will conduct an unbiased review of the inventory from a technical perspective. • Develop a well-defined system that will ensure effective reporting of all climate action implemented in the sector. • Harmonize the process of data collation and how data quality is to be preserved in the process of data collection and archiving. • The climate mitigation desk should be created in DPR to review, validate and verify all relevant climate-based mitigation project data submitted before upload in the national repository. • The capacity of experts involved in the MRV of mitigation process particularly at the highest level will need to be built.	
5	Stakeholders' Engagement	• Adequate data reconciliation and verification process by employing a third party or consultant. • Improved communication and capacity building through workshop and training to enhance knowledge in the application of the methodologies for preparing GHG inventories. • Capacity building to improve familiarization with the IPCC inventory guidelines, implementation techniques of mitigation activities and support opportunities for financing such projects • There should be profiling of all mitigation actions embarked upon by stakeholders in a Mitigation Action Registry (MAR) at the DPR.	2022 - 2024
6	Institutional arrangement	• A functional steering committee is required at the sectoral level as much as it is relevant also at the national level. • Quality Assurance and Control to be independent third-party Consultants or Auditors with competence in reviewing the data and process of GHG inventory or mitigation action emission reduction estimation. • It is also important to have a proper accreditation guideline for those who can be Auditors or participate in the Quality assurance and control process.	2022 - 2024

Source: CLN Analysis

8.2 Roadmap

Activities identified in section 8.1 above shows what needs to be put in place to have a robust MRV system. Key activities noted from the various actions centered around; data sources, data improvement, data validation, climate desk, improved institutional arrangement, improved legislative framework, methodology improvement, guidebook, and capacity building. The roadmap below gives a chronological step on how the various actions need to be put in place.

Table 8: The Roadmap and action plan

S/N	Components	Actions to be Taken	Time Schedule
1	Improved Institutional Arrangement	Present the proposed Institutional arrangement to the O&G stakeholders and ensure ownership of the structure to ensure the implementation is achieved over time	3 months after approval
2	Climate Desk creation	Create a climate desk in all the stakeholder companies to ensure that teams are put in place to realize the MRV system	3 – 6 months from the start-up of the MRV process
3	Data sources and measurement	Work with the Climate Desk team and other stakeholders to help identify all data sources and processes of measuring, archiving and transmission from one level to another.	3 – 6 months from the start-up of the MRV process
4	Data Improvement	Review current data being used carefully (processes and quality of data) and make recommendations on how it will be improved.	Continuous
5	Data Validation	Introduce process for quality assurance and control of all data and mitigation actions implemented within the sector	6 – 24 months from the start-up of the process
6	Methodology & Guidebook	Adopt or develop methodologies for estimating mitigation actions as well as develop a guidebook acceptable for MRV processes in the O&G sector	6 – 24 months from the start-up of the process, to be improved periodically
7	Capacity Building	This is a continuous activity and should be done periodically to improve the skills and knowledge of those involved in the processes.	Continuous
8	Improved Legislative framework	There are several gaps in terms of mandates and legislative powers that will allow various stakeholders to act accordingly. This legislative power takes time to put in place and hence must be approached in an articulated manner.	3 months – 2 years

Source: CLN Analysis

8.3 Conclusion

The goal of the MRV system for the O&G is to ensure quality and transparent data are collected to help evaluate and report climate policy and action. This will also ensure in building up quality data for UNFCCC reporting. A good MRV system allows for a clear picture of national priorities, strengths, and weaknesses.

A well-functioning institutional arrangement is achievable and while not everything is in place in the existing arrangement of the O&G sector MRV system, the plan to actualizing it needs to be put together and articulated. The structure should be made in such a way that it is realizable, flexible, and transparent. It should facilitate a consistent and continuous flow of data, engagement of expertise among industry stakeholders and consultants.

A well-structured MRV provides clarity on data gaps, expertise and capacity building required and areas where financial support is required. It will also help the reporting entities to assess climate risks and opportunities.

Some of the recommendations to actualize a functioning, transparent and robust MRV system include:

- Improving the existing Institutional arrangement will need a legislative framework to guide its implementation.
- The oil and gas stakeholders already have a framework that supports compliance in terms of data collection and transmission to the institution collating the data on behalf of the government. This needs to be further enhanced.
- The legislators (law makers) and executives (decision implementers) need to build capacity on climate policies and MRV processes.
- The Federal Government through the Department of Climate Change will need to arrange training programmes for all stakeholders periodically to keep them informed on international industry practices.
- Climate financing plans need to be mainstreamed into the annual budgeting process to ensure climate actions (mitigation and adaptation) are supported.
- There is a need to advocate for all sectoral stakeholders on a continuous process of data improvement.
- The Government should ensure that national Consultants, QA/QC experts and Researchers/Academics are integral part of the MRV process to enhance the quality of output.

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