

Improvements for Data Quality, Data Collection & Management (Institutional Arrangements)

Initiative for Climate Action Transparency - ICAT

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Deliverable #3

AUTHORS

Tendai M. Nzuma

PREPARED UNDER

The Initiative for Climate Action Transparency (ICAT)

Date

10 April 2025

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The Initiative for Climate Action Transparency (ICAT), supported by Austria, Canada, Germany, Italy, and the Children's Investment Fund Foundation.

Supported by:



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada

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



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Executive Summary

This report presents a comprehensive assessment of Namibia's climate data systems and institutional arrangements, developed to support the country's implementation of the Enhanced Transparency Framework (ETF) under the Paris Agreement. Its primary purpose is to identify and address existing gaps in data quality, collection practices, and coordination mechanisms that affect Namibia's ability to compile greenhouse gas (GHG) inventories, track the implementation of its Nationally Determined Contributions (NDCs), and report progress in a transparent, accurate, and timely manner.

The report focuses particularly on the energy sector and related emitting sectors, which are central to Namibia's mitigation commitments. It draws on national documents such as the First Biennial Transparency Report (BTR1), the Final Updated NDC (2023), and the First National GHG Inventory Document (1990–2022), as well as international guidelines from the IPCC and UNFCCC. Using a multi-tiered methodology that includes institutional mapping, stakeholder consultations, and a review of data management tools, the report evaluates the current landscape and proposes a roadmap for system-wide improvements.

The findings reveal that Namibia's climate data infrastructure is fragmented and heavily dependent on largely manual, project-based reporting processes. While key institutions like the Ministry of Environment, Forestry and Tourism (MEFT), Namibia Statistics Agency (NSA), and sectoral ministries are involved in data generation, there is no formalized national framework that assigns roles or enforces data-sharing obligations. Quality assurance and control procedures are either absent or inconsistently applied, and standardized data formats or metadata protocols are lacking. Although some digital tools and platforms have been piloted under ICAT and CBIT initiatives, a centralized Climate Data Management System (CDMS) has not yet been fully developed or institutionalized. In addition, technical capacity within government remains limited, with few permanent staff trained in inventory development, emissions modelling, or ETF reporting.

In response to these challenges, the report outlines a phased strategy to guide the strengthening of Namibia's climate transparency system. In the short term (0–1 year), it recommends establishing formal institutional focal points, adopting a national QA/QC protocol, and initiating a multi-sectoral data coordination platform. In the medium term (1–3 years), Namibia should prioritize the operationalization of a centralized CDMS, the standardization of data collection tools, and the delivery of targeted capacity-building programs. Over the longer term (3+ years), the focus should shift to legal and policy reforms, such as enacting a climate reporting regulation, embedding reporting roles into public service structures, and integrating emissions tracking into national development planning frameworks.

This report concludes with a call for coordinated action from all relevant stakeholders. Government ministries, local authorities, statistical agencies, and regulators must take collective ownership of their reporting roles. Development partners and technical institutions are urged to align their support with nationally defined priorities, focusing on long-term system sustainability. If implemented, the recommendations set out in this report will enable Namibia to build a transparent, resilient, and nationally owned climate data system—one that not only fulfills international obligations but also strengthens domestic policy, attracts climate finance, and accelerates the country's transition to a low-carbon and climate-resilient future.

1 Introduction

1.1 Background

Namibia, as a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, is committed to fulfilling its obligations under the Enhanced Transparency Framework (ETF). As a developing country Party, Namibia must regularly communicate climate-related information through Biennial Transparency Reports (BTRs), National Communications (NCs), and Nationally Determined Contributions (NDCs). A core component of these obligations is the establishment of robust systems for data quality management, institutional arrangements, and transparent data collection mechanisms.

Namibia's climate data infrastructure has evolved significantly over the past decade, with the Ministry of Environment, Forestry and Tourism (MEFT) leading national efforts through support from international initiatives such as the Initiative for Climate Action Transparency (ICAT), the Capacity Building Initiative for Transparency (CBIT), and the Global Environment Facility (GEF). The compilation of Namibia's First Biennial Transparency Report and Fifth National Communication (BTR1/NC5) in 2024, and the Second Updated NDC in 2023, underscored the critical need for improved data governance and institutional coordination to meet reporting standards and track progress towards mitigation goals.¹

1.2 Importance of Data Quality and Institutional Arrangements in Climate Reporting

Effective climate reporting is a stepwise process, each stage dependent on the integrity of the previous one. As illustrated in Figure 1, achieving full compliance with the Paris Agreement requires a solid foundation of high-quality data and well-coordinated institutional arrangements. This is particularly relevant for Namibia, where the national climate transparency framework is still maturing amidst limited technical capacity, data inconsistencies, and institutional fragmentation.

¹ Ministry of Environment, Forestry and Tourism (MEFT), *Namibia's First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024). Government of Namibia, *Final Updated Nationally Determined Contribution 2023* (Windhoek: MEFT, 2023).

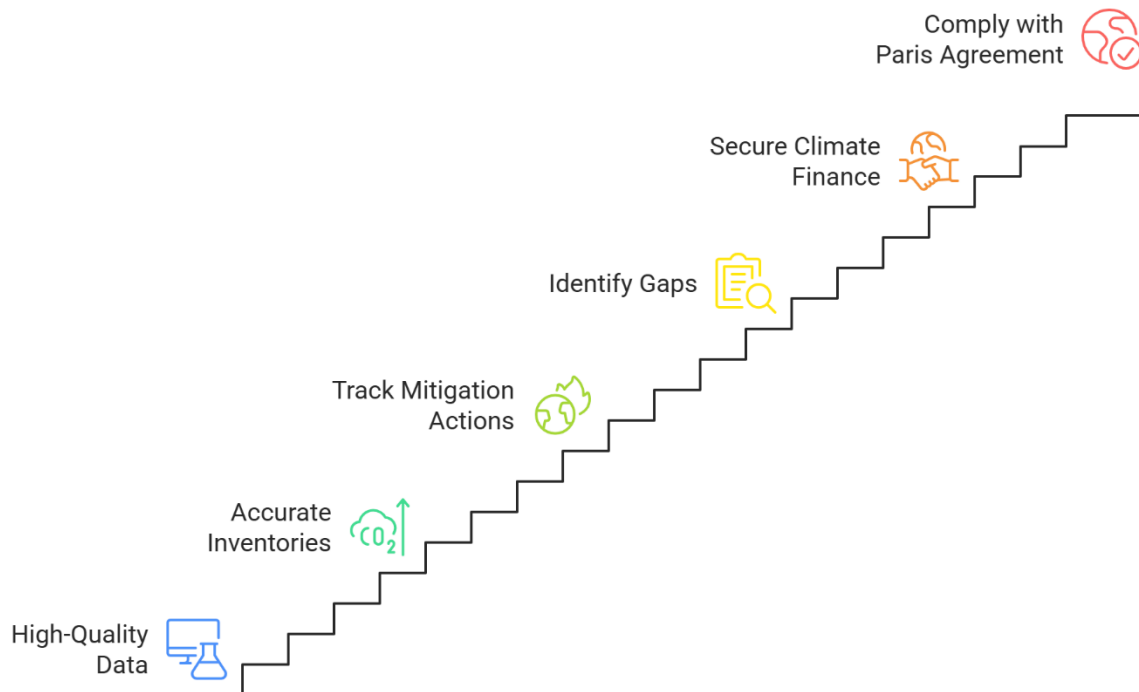


Figure 1. Achieving Effective Climate Reporting.

At the base of the reporting “ladder” in Figure 1 lies high-quality data—a prerequisite for all subsequent actions. Namibia has made notable progress in data generation through initiatives like the National GHG Inventory (NID1) and its latest Biennial Transparency Report (BTR1). However, challenges remain in terms of data completeness, sectoral disaggregation, and temporal consistency, particularly from subnational actors and the private sector.²

Building upon this foundation, accurate inventories are essential. Namibia’s national inventory draws from IPCC 2006 Guidelines and incorporates data across key sectors including energy, AFOLU, IPPU, and waste. Yet, further standardization of methodologies and strengthening QA/QC protocols is critical to enhancing the credibility of these outputs.³

The next step is the ability to track mitigation actions. With the 2023 Updated NDC highlighting mitigation targets across renewable energy, transport, and industrial efficiency, Namibia must institutionalize mechanisms to link emissions data with implemented policies. Weak feedback loops and limited real-time data integration currently hinder such tracking.⁴

Once mitigation tracking is established, Namibia can more effectively identify data and implementation gaps. A system-wide analysis can reveal inconsistencies in emissions baselines, data-sharing bottlenecks, and underreported mitigation co-benefits. This diagnostic capacity is essential for prioritizing institutional reforms and capacity-building efforts.

² Ministry of Environment, Forestry and Tourism (MEFT), *Namibia’s First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024).

³ Government of Namibia, *First National Inventory Document (1990–2022)* (Windhoek: MEFT, 2024).

⁴ Government of Namibia, *Final Updated Nationally Determined Contribution 2023* (Windhoek: MEFT, 2023).

Addressing these gaps creates the credibility and justification needed to secure climate finance. Donors and multilateral agencies increasingly require transparent reporting and traceable impacts. Namibia's improved data systems and NDC tracking capabilities can enhance access to climate finance through mechanisms like the Green Climate Fund and NDC Partnership.⁵

At the final step, these efforts culminate in Namibia's ability to comply with the Paris Agreement. This includes biennial submissions under the Enhanced Transparency Framework (ETF), demonstrating not only progress in reducing emissions but also improvements in institutional readiness, data infrastructure, and national accountability.

In essence, data quality and institutional arrangements are not stand-alone technical requirements but strategic enablers of Namibia's climate ambition, sustainable development, and international engagement.

1.3 Objectives of the Report

The overarching objective of this report is to assess and propose improvements for Namibia's systems for climate-related data quality management, data collection, and institutional arrangements, with a focus on the energy sector. Specifically, the report aims to:

- 1) Assess the current status of data quality assurance and data collection methodologies;
- 2) Review the institutional architecture governing climate data management and reporting;
- 3) Identify key challenges and barriers to effective data governance;
- 4) Propose actionable recommendations to enhance transparency, consistency, and coordination;
- 5) Outline a roadmap and monitoring framework to guide implementation of improvements.

This report is a key deliverable under Namibia's ICAT-supported project to develop a Nationally Determined Contributions (NDC) Tracking Framework for the energy sector and to support the institutionalization of the Enhanced Transparency Framework in line with Decision 18/CMA.1.⁶

1.4 Methodology and Sources of Information

This report adopts a multi-layered, participatory, and evidence-driven approach to assess and propose improvements in Namibia's data quality systems, data collection processes, and institutional arrangements for climate reporting. The methodology integrates desk-based analysis, stakeholder consultations, technical assessments, and global benchmarking to ensure alignment with international best practices and the specific needs of Namibia's energy and climate sectors.

⁵ ICAT, *Unfolding the Reporting Requirements for Developing Countries Under the Paris Agreement's Enhanced Transparency Framework* (UNEP DTU Partnership, 2019).

⁶ ICAT, *NDC Tracking Framework for the Energy Sector: Terms of Reference* (Windhoek: MEFT and EIF, 2024).

Tendai M. Nzuma, *Framework for Emissions Report Structure* (ICAT Namibia, 2024).

Figure 2 below highlights the core research activities that formed the foundation of this assessment.

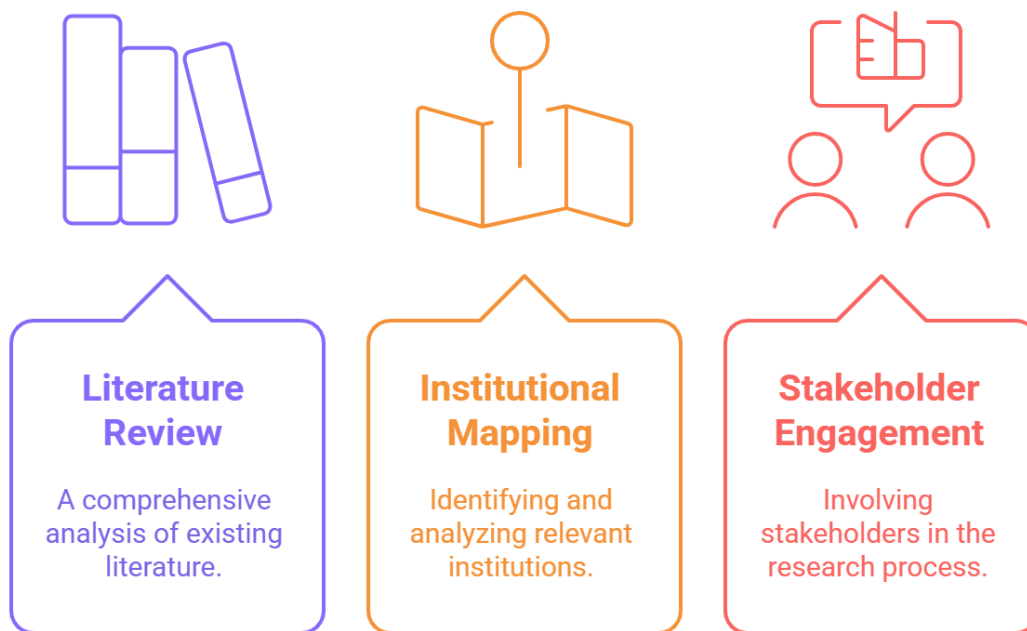


Figure 2. Core research activities supporting the assessment – literature review, institutional mapping, and stakeholder engagement.

Key Components of the Methodology:

1. Literature Review and Policy Analysis:

- A comprehensive review of national climate documents—including Namibia’s *First Biennial Transparency Report (2024)*, *Final Updated NDC (2023)*, and *First National Inventory Document (1990–2022)*—was conducted to establish the legal, procedural, and technical foundations for climate data systems.⁷
- International frameworks and tools such as the *ICAT Assessment Guides*, *GHG Projection Guidelines*, and the *Modalities, Procedures, and Guidelines (MPGs)* under Decision 18/CMA.1 were used as benchmarks.⁸

2. Institutional Mapping:

⁷ Ministry of Environment, Forestry and Tourism (MEFT). *Namibia’s First Biennial Transparency Report and Fifth National Communication*. Windhoek: Government of the Republic of Namibia, 2024. Government of Namibia. *Final Updated Nationally Determined Contribution 2023*. Windhoek: MEFT, 2023.

ICAT. *Unfolding the Reporting Requirements for Developing Countries Under the Paris Agreement’s Enhanced Transparency Framework*. UNEP DTU Partnership, 2019.

⁸ ICAT. *Mitigation: Reporting Information on Tracking Progress of Namibia’s NDC*. Windhoek: MEFT and ICAT, 2024.

ICAT. *Institutional Arrangements in GHG Inventory Process*. UNEP DTU Partnership, 2020.

- Roles and relationships among relevant institutions were systematically assessed to understand mandates, data responsibilities, and coordination mechanisms.
- Key entities included the MEFT, Namibia Statistics Agency, Ministry of Mines and Energy, NamPower, Electricity Control Board, and subnational authorities.

3. Stakeholder Engagement:

- Semi-structured interviews, validation workshops, and focus group discussions were held with technical officers, data custodians, and policymakers.
- This ensured local ownership, captured experiential knowledge, and validated draft recommendations emerging from the analysis.

4. Gap and Needs Assessment:

- This included evaluating system-level barriers such as limited QA/QC practices, fragmented databases, and insufficient legal frameworks for data sharing.
- Priority gaps were mapped in relation to Namibia's ability to meet the Enhanced Transparency Framework (ETF) under the Paris Agreement.

5. Comparative and Contextual Analysis:

- Namibia's evolving framework was compared with international case studies (e.g., Vietnam, Philippines, Kenya under ICAT), with adaptations proposed based on local institutional realities and capacities.

6. Validation through National Processes:

- Findings were presented for technical review under the ICAT Namibia framework, aligning recommendations with the in-development NDC Tracking Framework for the Energy Sector.⁹

⁹ ICAT. *NDC Tracking Framework for the Energy Sector: Terms of Reference*. Windhoek: MEFT and EIF, 2024.

2 Current Status Assessment

2.1 Data Quality Overview

2.1.1 Existing Data Systems and Accuracy Levels

Namibia's climate data ecosystem comprises a mix of centralized and decentralized systems, with data originating from a diverse set of ministries, public agencies, and external partners. The Ministry of Environment, Forestry and Tourism (MEFT), through its Climate Change Unit, serves as the national coordinating body for GHG inventory compilation and climate reporting, supported by technical input from line ministries and institutions such as:

- **Namibia Statistics Agency (NSA)** – responsible for national socioeconomic and energy statistics;
- **Ministry of Mines and Energy (MME)** and **NamPower** – key providers of energy consumption and production data;
- **Electricity Control Board (ECB)** – regulator maintaining utility-level electricity generation and transmission data;
- **Ministry of Agriculture, Water and Land Reform (MAWLR)** – primary source for AFOLU sector data;
- **City and Municipal Councils** – data contributors in the waste and transport sectors.¹⁰

The core GHG data is compiled using the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, and emission factors have been adapted using both Tier 1 default values and country-specific activity data where available.¹¹ Despite notable efforts, Namibia's data accuracy is constrained by outdated time series in certain sectors (e.g., industrial processes), inconsistent reporting formats across institutions, and limited real-time access to disaggregated datasets.

2.1.2 Identified Gaps and Inconsistencies

Several data quality challenges persist across Namibia's reporting infrastructure:

- **Temporal gaps:** Time series discontinuities exist for several key indicators, especially in older datasets (e.g., fuel use in off-grid mining operations or waste generation in rural municipalities).

¹⁰ Ministry of Environment, Forestry and Tourism (MEFT), *Namibia's First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024).

¹¹ Government of Namibia, *First National Inventory Document (1990–2022)* (Windhoek: MEFT, 2024).

- **Incomplete sectoral coverage:** Informal energy use (e.g., biomass in rural households), private-sector energy efficiency activities, and small-scale renewables are often underreported or unrecorded.
- **Data inconsistency:** Inconsistencies in measurement units, data formats, and metadata standards hinder aggregation and cross-comparison across ministries and reporting years.
- **Lack of harmonization:** No unified data architecture or central platform currently exists for integrated GHG data management, resulting in siloed reporting structures.
- **Dependency on donor-supported data collection efforts:** Some sectoral data (especially AFOLU and adaptation co-benefits) are collected ad hoc during project cycles, which limits sustainability.¹²

These issues were similarly highlighted in Namibia's *First Biennial Transparency Report and National Inventory Document*, which recommended more robust archiving systems, regular data updates, and clear designation of data ownership across institutions.¹³

2.1.3 Data Validation Procedures (or Lack Thereof)

Quality Assurance and Quality Control (QA/QC) procedures remain nascent in Namibia. While the MEFT coordinates the national inventory process and applies basic checks during compilation, there is:

- No standardized national **QA/QC manual** currently adopted;
- **Validation protocols** are informal and highly dependent on the experience of technical consultants;
- **Cross-institutional review mechanisms** are weak or non-operational, leading to limited peer validation or stakeholder feedback loops;
- **IPCC-recommended tiered QA/QC measures**, such as consistency checks, uncertainty analysis, and independent expert reviews, are applied inconsistently or only for flagship reports.

The ICAT-supported diagnostic work and CBIT consultations have identified QA/QC as a strategic gap requiring immediate policy and technical attention. Standard operating procedures (SOPs) for verification and periodic quality reviews would enhance confidence in Namibia's emissions reporting, especially as the country transitions into more advanced ETF-compliant transparency submissions.¹⁴

¹² Government of Namibia, *Final Updated Nationally Determined Contribution (NDC)* (Windhoek: MEFT, 2023).

¹³ Government of Namibia, *Final Updated Nationally Determined Contribution (NDC)* (Windhoek: MEFT, 2023).

¹⁴ ICAT, *Unfolding the Reporting Requirements for Developing Countries Under the Paris Agreement's Enhanced Transparency Framework* (UNEP DTU Partnership, 2019).

2.2 Data Collection Practices

2.2.1 Overview of Current Data Collection Processes in the Energy or Climate Sectors

Namibia's data collection processes for climate and energy reporting are partially structured but remain highly fragmented. Data is collected through a combination of administrative records, statistical surveys, project monitoring reports, and technical studies conducted by ministries, state-owned enterprises, and development partners. These processes serve as the foundation for Namibia's national greenhouse gas (GHG) inventory and Biennial Transparency Report (BTR).¹⁵

In the energy sector, key datasets include:

- National energy balances and fuel import records from the Ministry of Mines and Energy (MME);
- Electricity generation and consumption statistics from NamPower and the Electricity Control Board (ECB);
- Energy usage in transportation and public infrastructure from the Ministry of Works and Transport (MWT) and municipal councils.

For the climate sector, broader data inputs come from:

- The Ministry of Environment, Forestry and Tourism (MEFT), which compiles emissions data and coordinates national reporting;
- The Namibia Statistics Agency (NSA), which supports population, economic, and industrial activity statistics critical for emissions estimations;
- Specialized project-based data streams (e.g., from GIZ, UNDP, or ICAT) that provide temporary data enhancements, especially in adaptation, off-grid renewables, or agriculture.¹⁶

Despite these efforts, data collection remains largely manual or Excel-based, and not integrated into a centralized system. This results in inefficiencies, duplication, and potential gaps in time series consistency and completeness.¹⁷

2.2.2 Tools, Technologies, and Protocols Used

Namibia primarily uses Microsoft Excel-based templates for data collation, calculation, and reporting. While these are customized for GHG inventory compilation following IPCC 2006 methodologies, they lack features for data integration, version control, and automated QA/QC.

The IPCC Inventory Software, available through the UNFCCC, has been used occasionally but is not yet institutionalized across agencies. In some ICAT-supported assessments, tools

¹⁵ Ministry of Environment, Forestry and Tourism (MEFT), *Namibia's First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024).

¹⁶ ICAT, *Institutional Arrangements for MRV and Data Systems: International Best Practices* (UNEP DTU Partnership, 2020).

¹⁷ Government of Namibia, *Final Updated Nationally Determined Contribution (NDC)* (Windhoek: MEFT, 2023).

such as GACMO (Greenhouse Gas Abatement Cost Model) and the LEAP (Long-range Energy Alternatives Planning) system have been piloted for emissions scenario modelling and mitigation tracking.¹⁸

Notably, Namibia does not yet operate a national climate data management system (CDMS) or a real-time emissions monitoring platform. Data exchange is typically done through email, workshops, and bilateral requests, rather than automated or policy-backed data-sharing protocols.

There are also no binding national standards for climate-related data documentation, metadata preservation, or storage formats—though the need for these has been flagged in both the ICAT and CBIT assessments.¹⁹

2.2.3 Institutional Roles and Responsibilities

Data collection in Namibia’s climate and energy sectors involves a variety of actors, each with distinct but often overlapping roles (Table 1):

Table 1. Institutional Roles and Primary Responsibilities.

Institution	Primary Responsibilities
MEFT	Overall coordination of GHG inventory; compilation of national reports; lead for ETF implementation
MME	Energy data management; fuel imports; national energy balance; energy efficiency reporting
NamPower	Generation, transmission, and distribution data, especially for the grid
ECB	Regulatory oversight; licensing and reporting of IPPs and utilities
NSA	Socioeconomic statistics and national accounts; supports estimation of emission factors and activity data
Municipalities	Waste and transport data at the local level; often collected through urban planning or engineering units
Development Partners	Fund and sometimes directly collect data through pilot projects (e.g., ICAT, GIZ, UNDP)
Private Sector	Industrial production and energy consumption data, though reporting is generally voluntary or confidential

¹⁸ UNFCCC, *GHG Inventory Software and Methodological Guidance for Non-Annex I Countries* (Bonn: UNFCCC Secretariat, 2021).

¹⁹ ICAT, *Institutional Arrangements for MRV and Data Systems: International Best Practices* (UNEP DTU Partnership, 2020).

While coordination mechanisms exist—such as the National GHG Inventory Technical Working Group—there is no formal inter-institutional MoU or legal framework mandating data sharing or regular contributions to national reporting.²⁰

This lack of binding cooperation leads to reliance on personal relationships or project-specific arrangements to access and exchange data. As Namibia prepares to institutionalize its NDC Tracking Framework and enhance transparency systems, formalizing data flows, protocols, and digital tools will be essential to improve the efficiency and reliability of data collection.

2.3 Institutional Arrangements

2.3.1 Organizational Structure for Data Governance

Namibia’s institutional arrangements for climate data governance are anchored within the Ministry of Environment, Forestry and Tourism (MEFT), which acts as the national focal point to the UNFCCC and coordinates all climate reporting obligations under the Enhanced Transparency Framework (ETF). The MEFT’s Climate Change Unit, in collaboration with the Environmental Commissioner’s office and relevant directorates, oversees the preparation of greenhouse gas (GHG) inventories, Biennial Transparency Reports (BTRs), and National Communications (NCs).²¹

However, the country does not yet have a legally binding institutional framework (e.g., through an act of Parliament) that formally codifies roles, responsibilities, or reporting timelines for all contributing institutions. As such, the current governance system is largely informal and project-driven, with reliance on ad hoc technical working groups and memoranda of understanding facilitated through development partner support (e.g., ICAT, CBIT, UNDP).²²

The national inventory system functions as a hub-and-spoke model, with MEFT at the center coordinating inputs from line ministries, regulators, public utilities, municipalities, and the Namibia Statistics Agency (NSA). The structure lacks a permanent secretariat or fully staffed national inventory team, often depending on external consultants during reporting cycles.²³

2.3.2 Roles and Mandates of Involved Institutions

Key institutions engaged in climate data governance and reporting include (Table 2):

Table 2. Institutions and Role in Climate Data.

Institution	Mandate / Role in Climate Data
MEFT	National coordination of GHG inventory and climate reporting; lead ETF institution; compiles BTRs and NCs.

²⁰ Ministry of Environment, Forestry and Tourism (MEFT), *Namibia’s First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024).

²¹ MEFT, *Namibia’s First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024).

²² ICAT, *Unfolding the Reporting Requirements for Developing Countries Under the Paris Agreement’s Enhanced Transparency Framework* (UNEP DTU Partnership, 2019).

²³ Government of Namibia, *First National Inventory Document (1990–2022)* (Windhoek: MEFT, 2024).

Institution	Mandate / Role in Climate Data
Namibia Statistics Agency (NSA)	Collects official economic and demographic data; contributes socioeconomic indicators used in emissions estimates (e.g., population, GDP).
Ministry of Mines and Energy (MME)	Manages national energy balance; provides fuel consumption and production data critical for energy sector emissions.
NamPower	National electricity utility; provides data on grid electricity generation, losses, and renewable energy integration.
Electricity Control Board (ECB)	Licensing and regulation of IPPs; collects data on off-grid and decentralized energy generation.
Ministry of Works and Transport (MWT)	Compiles transport fuel consumption data; involved in vehicle emissions data development.
Ministry of Agriculture, Water and Land Reform (MAWLR)	Provides agricultural activity data and land use statistics; key source for AFOLU sector inputs.
Municipalities / Local Authorities	Responsible for collecting waste management data and localized emissions information.
Development Partners / NGOs	Often fund data collection pilots or contribute technical support for reporting systems (e.g., ICAT Namibia, GIZ, UNDP). ²⁴
Green Hydrogen Council	Provides strategic oversight and coordination for the development, implementation, and regulation of the country's green hydrogen initiatives.

While these entities contribute essential data, the lack of permanent data-sharing mandates and absence of a centralized data portal pose challenges to sustainability, consistency, and institutional memory.

2.3.3 Inter-Agency Collaboration and Coordination Mechanisms

Coordination across institutions is facilitated primarily through the National Climate Change Committee (NCCC) and technical working groups (TWGs) convened during reporting cycles. These structures are convened by MEFT and include representatives from relevant ministries, parastatals, academia, and development partners. However, these mechanisms face several limitations:

- Irregular engagement: Meetings are typically reactive—triggered by reporting deadlines or donor-funded projects—rather than institutionalized as part of a routine data governance cycle.
- No formal data-sharing protocols: Information flows are managed informally, often through personal networks, which compromises transparency and continuity.

²⁴ Government of Namibia, *Final Updated Nationally Determined Contribution (NDC)* (Windhoek: MEFT, 2023).

- Limited legal backing: In the absence of a climate transparency regulation or executive directive, coordination relies heavily on goodwill and project leverage.
- Fragmented digital infrastructure: There is no interoperable system that allows line ministries to upload or validate their datasets within a shared national database.²⁵

Notably, the ICAT Namibia project has proposed the development of a Climate Data Management System (CDMS) as part of its NDC Tracking Framework for the energy sector. This would formalize data flows, designate institutional focal points, and integrate quality control protocols across agencies. If institutionalized, it would represent a transformative step toward ETF-aligned national reporting.²⁶

²⁵ ICAT Namibia, *NDC Tracking Framework for the Energy Sector: Terms of Reference* (MEFT and EIF, 2024).

²⁶ ICAT, *Unfolding the Reporting Requirements for Developing Countries Under the Paris Agreement's Enhanced Transparency Framework* (UNEP DTU Partnership, 2019).

3 Identified Challenges and Barriers

Namibia’s efforts to establish a functional and credible national climate transparency framework have been significant. However, several technical, institutional, and human capacity challenges continue to limit the effectiveness and sustainability of data quality, collection, and governance systems. These barriers affect the country’s ability to meet reporting obligations under the Enhanced Transparency Framework (ETF) and to track the implementation of its Nationally Determined Contributions (NDCs).

3.1 Technical Barriers

One of the most pressing challenges is the reliance on outdated, manual systems for data collection, aggregation, and reporting (Figure 3). Most institutions still use Excel-based spreadsheets, which are prone to data loss, human error, and lack real-time updating features.²⁷

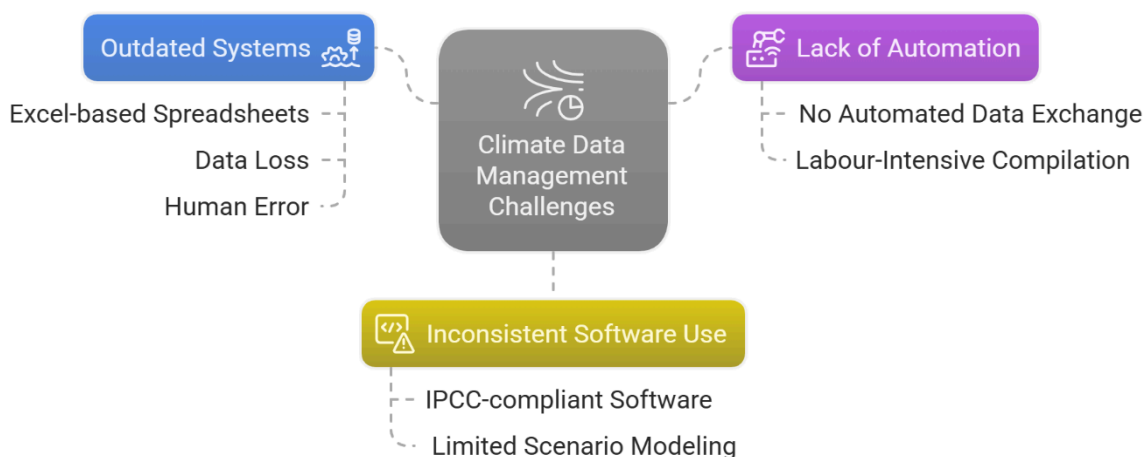


Figure 3. Challenges in Namibia's Climate Data Management.

The absence of automated data exchange protocols or digital interfaces between line ministries, utilities, and the Ministry of Environment, Forestry and Tourism (MEFT) makes national GHG inventory compilation labour-intensive and slow. Namibia does not yet operate

²⁷ MEFT, *Namibia’s First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024).

a centralized Climate Data Management System (CDMS) or emissions registry, though such systems have been proposed under the ICAT Namibia project.²⁸

Moreover, inconsistent use of IPCC-compliant software tools (e.g., the IPCC Inventory Software, GACMO or LEAP) limits Namibia's ability to model scenarios or apply Tier 2/3 methodologies for key sectors like energy and agriculture.²⁹

3.2 Institutional and Regulatory Issues

Namibia's institutional arrangements remain partially informal, relying heavily on project-based coordination and donor-supported engagements. While technical working groups exist for GHG inventory compilation and climate reporting, there is no enforceable legal framework mandating institutional roles, timelines, or data-sharing obligations across sectors.³⁰

Key regulatory and procedural gaps include:

- Unclear mandates and overlapping responsibilities among MEFT, NSA, MME, and other sectoral agencies;
- Lack of standard operating procedures (SOPs) for data collection, validation, and archiving;
- Absence of institutional MoUs or data-sharing agreements, which weakens the continuity of reporting when personnel change;
- No dedicated national regulation that supports ETF-aligned reporting and institutional coordination.³¹

These limitations undermine Namibia's capacity to move from ad hoc project-based reporting to a sustainable and nationally owned transparency system.

3.3 Human Capacity and Resource Limitations

Human resource shortages remain a systemic constraint. Technical staff responsible for inventory compilation, emissions modelling, and climate tracking are often overstretched, undertrained, or reliant on external consultants for key reporting deliverables.³²

Challenges in this area include (*see Figure 4*):

- Limited number of trained GHG inventory specialists within government agencies.
- Lack of institutionalized training programs or capacity-building pipelines in collaboration with universities or technical colleges.

²⁸ ICAT Namibia, *NDC Tracking Framework for the Energy Sector: Terms of Reference* (MEFT and EIF, 2024).

²⁹ UNFCCC, *GHG Inventory Software and Methodological Guidance for Non-Annex I Countries* (Bonn: UNFCCC Secretariat, 2021).

³⁰ Government of Namibia, *First National Inventory Document (1990–2022)* (Windhoek: MEFT, 2024).

³¹ ICAT Namibia, *NDC Tracking Framework for the Energy Sector: Terms of Reference* (MEFT and EIF, 2024).

³² Government of Namibia, *Final Updated Nationally Determined Contribution (NDC)* (Windhoek: MEFT, 2023).

- High staff turnover, especially at subnational and project level, leading to loss of institutional memory.
- Inadequate financial resources allocated for routine data collection, archiving, and system upgrades.³³

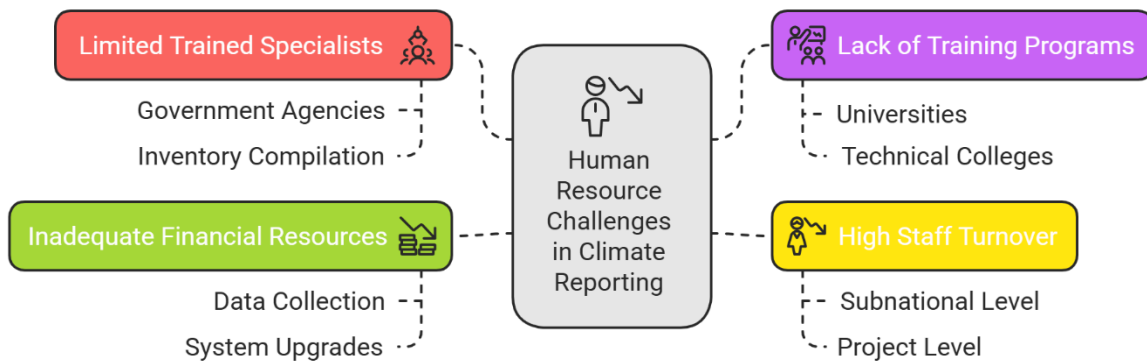


Figure 4. Human Resource Challenges in Climate Reporting.

Without strategic investment in institutional capacity development, including staff retention and training, the robustness of Namibia’s climate reporting system will remain vulnerable.

3.4 Data Sharing and Accessibility Concerns

Inter-agency data sharing is inconsistent and largely voluntary, resulting in fragmented datasets, duplicated efforts, and long delays in accessing information required for national reports. This is exacerbated by:

- Lack of a formalized digital infrastructure to support secure, routine data exchanges.
- Concerns over data sensitivity or ownership, particularly from private sector actors and parastatals.
- Incompatible data formats and absence of metadata standards.
- Poor archival practices, which limit the traceability and reproducibility of past estimates.³⁴

These issues hinder transparency, reduce confidence in the integrity of GHG estimates, and limit Namibia’s ability to scale up real-time NDC tracking or subnational contributions.

³³ ICAT, *Unfolding the Reporting Requirements for Developing Countries Under the Paris Agreement’s Enhanced Transparency Framework* (UNEP DTU Partnership, 2019).

³⁴ Government of Namibia, *First National Inventory Document (1990–2022)* (Windhoek: MEFT, 2024).

4 Proposed Improvements

4.1 Enhancing Data Quality

Namibia’s capacity to produce transparent, consistent, and policy-relevant climate data hinges on improving the underlying systems and practices that govern data quality. Drawing on both international best practices and country-specific gaps identified in recent transparency reports, this section presents three key strategies for improving data quality in the short to medium term: developing QA/QC protocols, standardizing data formats and units, and institutionalizing validation and verification procedures.

4.1.1 Development of QA/QC Protocols

Namibia currently lacks a national, institutionalized Quality Assurance and Quality Control (QA/QC) system for GHG data and broader climate reporting. While some quality checks are performed during inventory compilation (mainly by consultants or external experts), these are often informal and lack documentation or continuity mechanisms.³⁵

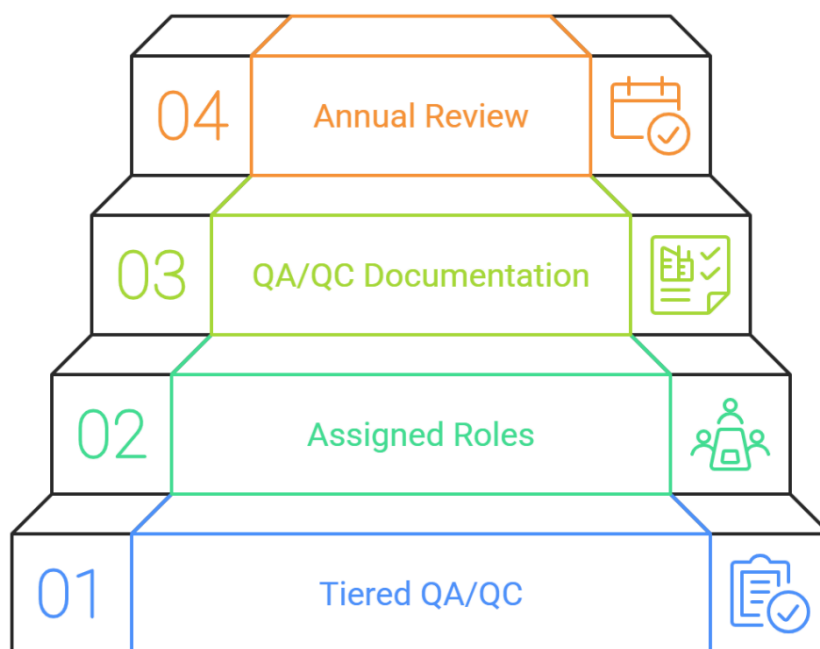


Figure 5. Enhancing data quality.

To address this gap, Namibia should develop and adopt a national QA/QC protocol aligned with the IPCC’s *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, which outlines systematic steps for quality management across the GHG inventory process.³⁶ The protocol should include (Figure 5):

³⁵ Ministry of Environment, Forestry and Tourism (MEFT), *Namibia’s First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024).

³⁶ IPCC, *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (Geneva: IPCC, 2000).

- 1) Tiered QA/QC procedures, differentiating basic QC (e.g., data entry checks, completeness reviews) from advanced QA (e.g., third-party reviews, recalculation triggers);
- 2) Assigned roles and responsibilities, clearly designating which institutions or personnel perform specific checks at each stage of data processing;
- 3) QA/QC documentation, including logs of errors identified, corrective actions taken, and feedback incorporated in future cycles;
- 4) Annual review cycles, using findings from past inventories to continuously refine procedures and reduce uncertainty levels.

A pilot QA/QC system was recommended during Namibia's CBIT project and could serve as the foundation for institutional adoption across sectors.³⁷

4.1.2 Standardization of Data Formats and Units

Inconsistent data formats, units, and metadata structures currently pose a significant barrier to integration and comparability of emissions data across Namibia's institutions. For instance, energy data reported in tons of oil equivalent (toe) must often be manually converted to terajoules (TJ) or CO₂-equivalent before it can be used in inventory calculations, which introduces room for error and inefficiency.³⁸

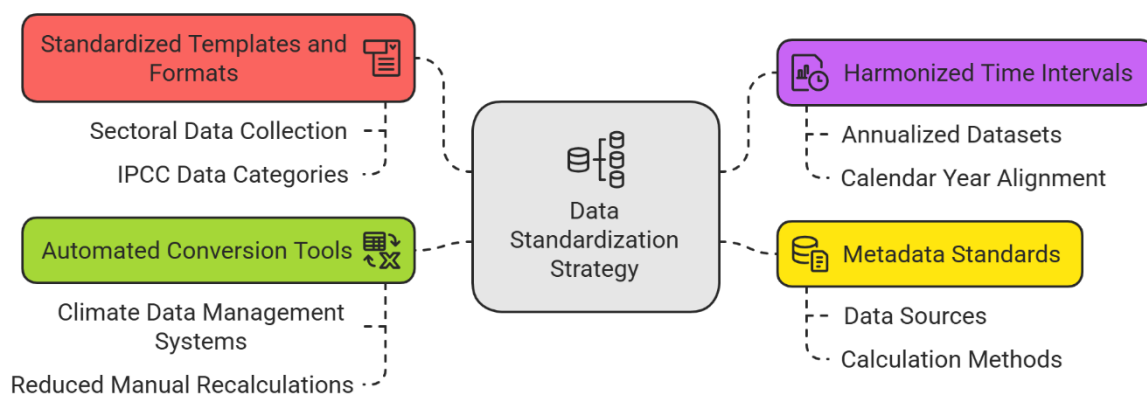


Figure 6. Namibia's Data Standardization Strategy.

Namibia should pursue a coordinated data standardization strategy, which includes (Figure 6):

- Standardized templates and formats for sectoral data collection, aligned with IPCC data categories (e.g., CRF codes) and units of measure;
- Harmonized time intervals for reporting (e.g., annualized datasets aligned to the calendar year);
- Metadata standards, describing data sources, calculation methods, and assumptions used;

³⁷ ICAT, *Unfolding the Reporting Requirements for Developing Countries under the Paris Agreement's Enhanced Transparency Framework* (UNEP DTU Partnership, 2019).

³⁸ Government of Namibia, *Final Updated Nationally Determined Contribution (NDC)* (Windhoek: MEFT, 2023).

- Automated conversion tools, integrated into future climate data management systems to reduce reliance on manual recalculations.

This would improve interoperability across datasets collected by the Ministry of Mines and Energy, the Namibia Statistics Agency, and MEFT, and reduce delays in compiling emissions inventories.⁵

4.1.3 Introduction of Validation and Verification Procedures

Currently, most climate data in Namibia is not subject to formal validation or third-party verification. Instead, review processes occur only during major national report development (e.g., for the BTR), and they typically involve short-term consultants. This limits consistency, transparency, and institutional learning.

Namibia should implement both internal validation and external verification protocols, consistent with guidance under the UNFCCC. These include:

- Automated validation rules during data entry (e.g., range checks, flagging of outliers or missing values);
- Cross-checking mechanisms between datasets, such as comparing fuel sales data with consumption reported by end users;
- Independent expert reviews to validate emissions estimates and assumptions;
- Peer reviews across institutions, where sectoral line ministries participate in reviewing each other's datasets for consistency and completeness.

Over time, these procedures should be embedded in a broader National Climate Data Quality Framework, as envisioned under the ICAT-supported NDC Tracking Framework for the Energy Sector.³⁹ This would not only improve trust in Namibia's climate data but also support evidence-based policymaking and attract greater climate finance by demonstrating transparency and accountability.

4.2 Strengthening Data Collection

Accurate, timely, and comprehensive data collection is the cornerstone of Namibia's climate transparency system. Despite commendable progress in compiling national reports such as the *First Biennial Transparency Report (BTR1)* and *First National Inventory Document (NID1)*, significant improvements are required in data collection methods, digital integration, and sectoral coverage to meet ETF standards.⁴⁰

4.2.1 Improved Methodologies for Consistent and Timely Data Collection

Namibia's current data collection efforts are often project-driven, episodic, and manually coordinated, resulting in delays, inconsistencies, and gaps—particularly in the transport, informal energy use, and off-grid sectors.⁴¹

³⁹ ICAT, *Introduction to the ICAT Assessment Guides* (Bonn: ICAT; Verra; UNEP DTU Partnership, 2019).

⁴⁰ MEFT, *Namibia's First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024).

⁴¹ Government of Namibia, *Final Updated Nationally Determined Contribution (NDC)* (Windhoek: MEFT, 2023).

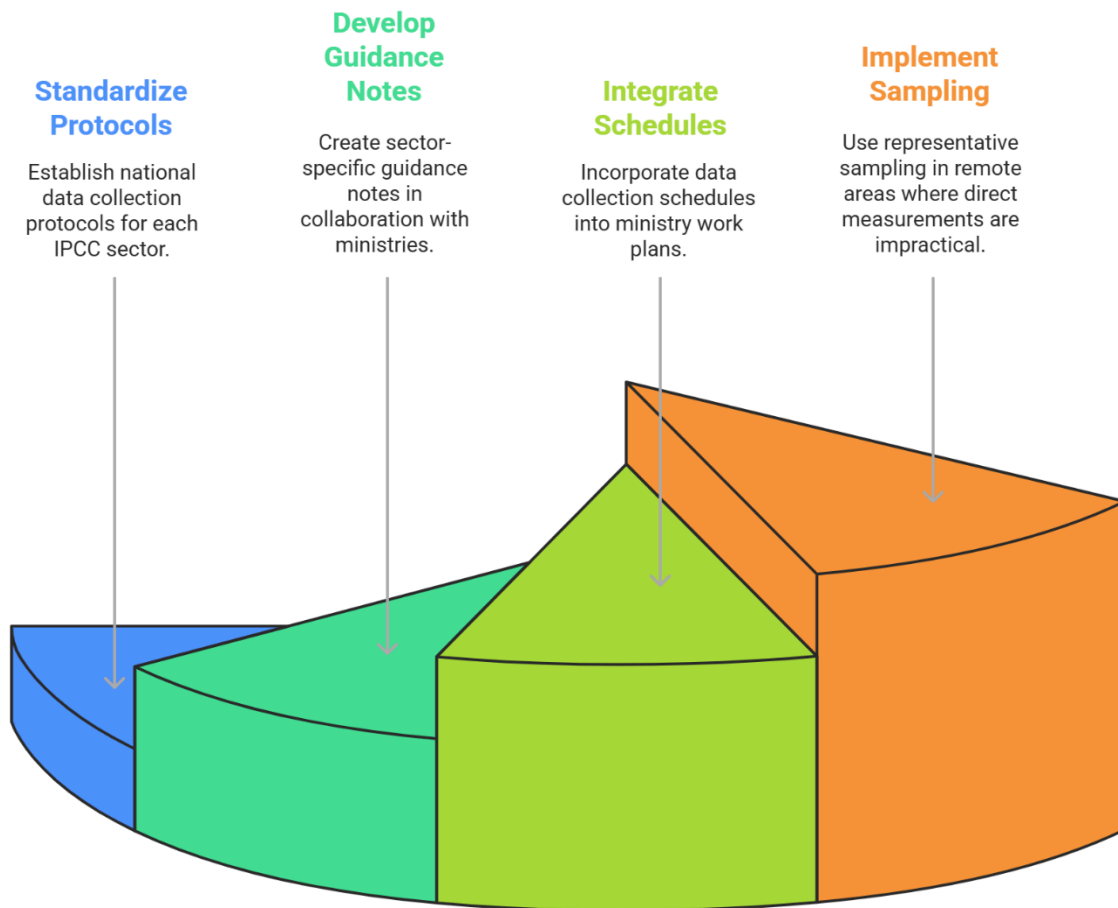


Figure 7. Strengthening Data Collection in Namibia.

To strengthen collection processes, Namibia should implement standardized, nationally endorsed data collection methodologies aligned with the IPCC’s *2006 Guidelines* and tailored to national capacity. This includes (Figure 7):

- National data collection protocols for each IPCC sector, with clearly defined frequency (e.g., quarterly fuel consumption data), units of measure, and data custodians;
- Sector-specific guidance notes, developed in collaboration with line ministries and national statistical offices;
- Routine data collection schedules, integrated into ministry work plans and national statistical reporting cycles, not just linked to reporting deadlines;
- Use of representative sampling where direct measurements are impractical, especially in informal or remote areas.

Implementing these standardized practices would improve data comparability across years and reduce the reliance on assumptions or estimations.⁴²

⁴² IPCC, *2006 Guidelines for National Greenhouse Gas Inventories* (Geneva: IPCC, 2006).

4.2.2 Use of Digital Tools and Automation

Digital transformation offers Namibia an opportunity to leapfrog legacy data systems and reduce inefficiencies associated with manual reporting. There is increasing global precedent for leveraging digital technologies such as mobile data collection apps, dashboard-based visualization tools, and IoT-enabled sensors for environmental monitoring and reporting.⁴³

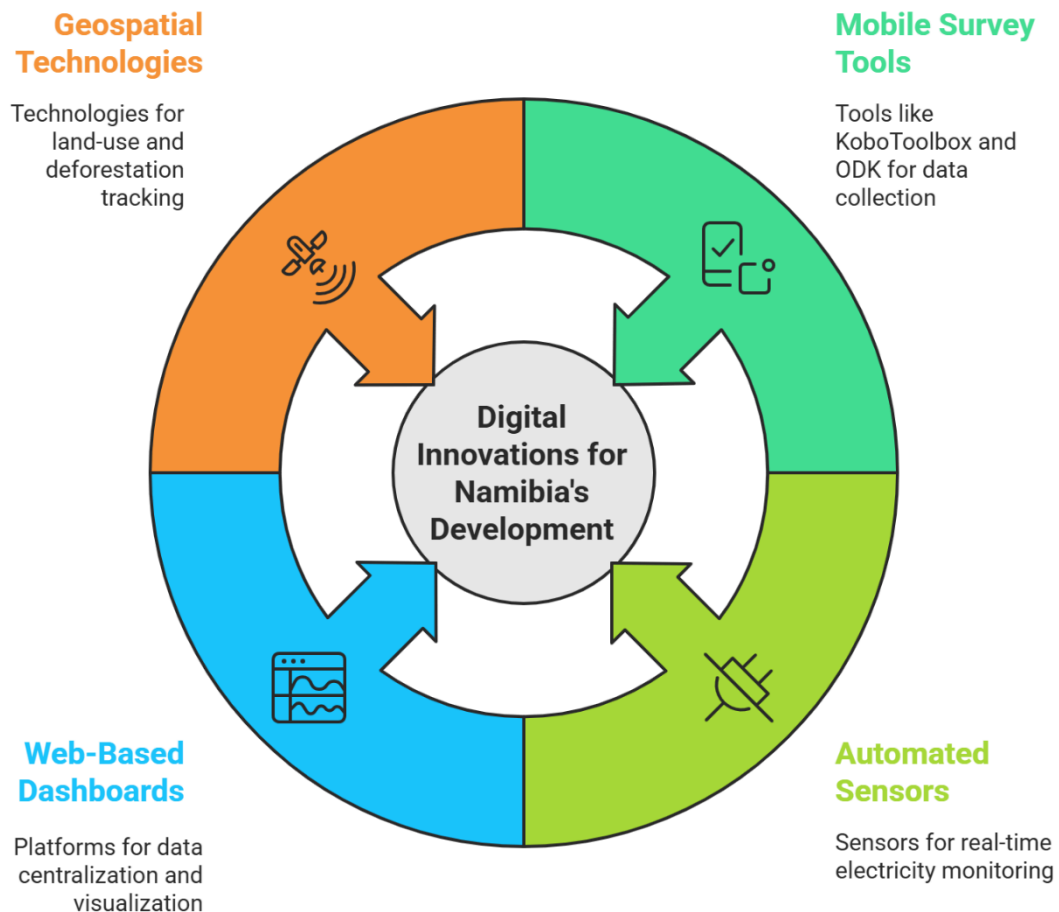


Figure 8. Digital Innovations for Namibia's Development.

Namibia can pilot and scale digital innovations through (Figure 8):

- Mobile-based survey tools (e.g., KoboToolbox, ODK) for municipal waste audits, household energy use surveys, or field-level AFOLU data collection;
- Automated sensors for electricity metering (e.g., real-time monitoring of solar and grid energy generation);
- Web-based dashboards to centralize data uploads, access controls, metadata, and visualization across institutions (e.g., similar to Kenya's GHG MRV platform⁴⁴);

⁴³ ICAT, *Unfolding the Reporting Requirements for Developing Countries Under the Paris Agreement's Enhanced Transparency Framework* (UNEP DTU Partnership, 2019).

⁴⁴ Kenya: Strengthening Institutional Arrangements for MRV in the Energy Sector https://climateactiontransparency.org/wp-content/uploads/2021/07/2D_Kenya_MRV_Institutions_final.pdf

- Geospatial technologies and satellite imagery for land-use classification, deforestation tracking, and estimation of biomass changes.

Under the ICAT Namibia project, there are plans to integrate these features into a Climate Data Management System (CDMS) that supports regular data flows and tracking of NDC implementation.⁴⁵

4.2.3 Expanding Data Coverage Across Sub-Sectors and Regions

Currently, Namibia's climate data is disproportionately urban, grid-connected, and sectorally concentrated—leaving substantial gaps in informal, off-grid, and subnational activities.⁴⁶ For example, emissions from off-grid mining operations, artisanal charcoal production, or decentralized solar installations are often underreported or not reported at all.

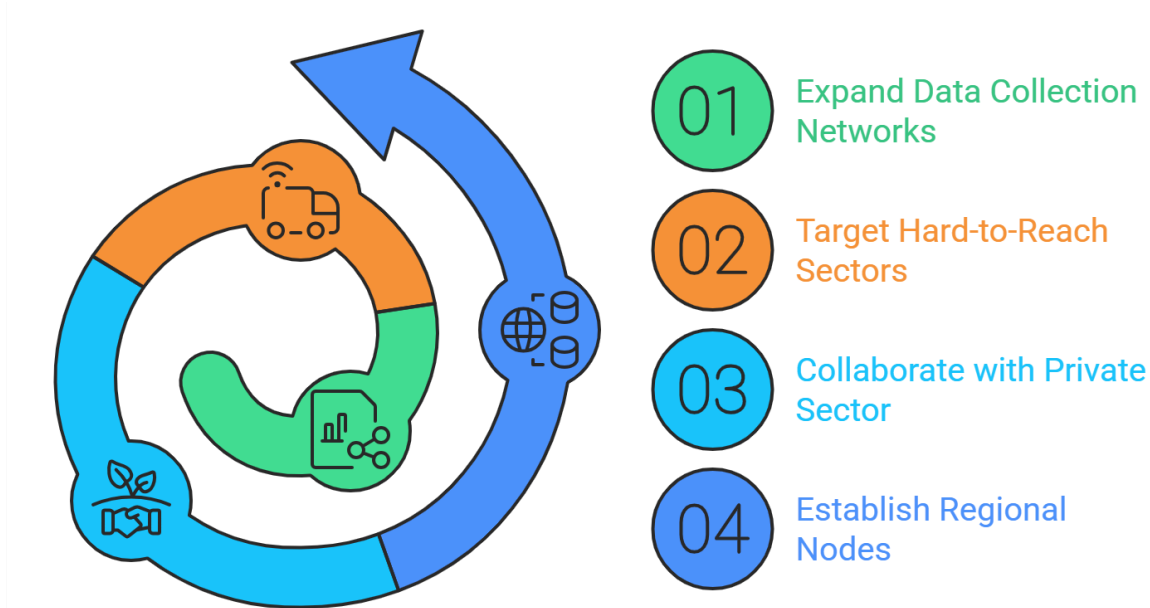


Figure 9. Namibia's Strategy for Enhanced Data Collection and Reporting.

To address this, Namibia should (Figure 9):

- 1) Expand regional and subnational data collection networks, empowering local authorities and community-level actors to contribute emissions and activity data;
- 2) Target hard-to-reach sectors such as informal transportation (e.g., taxis, buses), household biomass use, and decentralized energy production;
- 3) Collaborate with private sector actors, especially independent power producers (IPPs), large energy consumers, and agri-businesses, to encourage voluntary reporting under confidentiality agreements;
- 4) Establish regional nodes or focal points within line ministries and agencies to decentralize data collection and reporting responsibilities.

⁴⁵ ICAT Namibia, *NDC Tracking Framework for the Energy Sector: Terms of Reference* (MEFT and EIF, 2024).

⁴⁶ Government of Namibia, *First National Inventory Document (1990–2022)* (Windhoek: MEFT, 2024).

These efforts will enhance Namibia’s ability to capture disaggregated emissions data and ensure all sectors meaningfully contribute to climate mitigation planning and tracking.

4.3 Institutional Strengthening

Robust institutional arrangements are fundamental to Namibia's ability to produce transparent, consistent, and policy-relevant climate data. While progress has been made, several challenges persist, including unclear mandates, limited coordination, and insufficient technical capacity. Addressing these issues is crucial for effective implementation of the Enhanced Transparency Framework (ETF) under the Paris Agreement.

4.3.1 Clear Definition of Institutional Roles and Data Responsibilities

Namibia's current climate data governance involves multiple stakeholders, including the Ministry of Environment, Forestry and Tourism (MEFT), the Namibia Statistics Agency (NSA), and various sectoral ministries. However, the absence of formally assigned responsibilities often leads to overlaps, data delays, or gaps in coverage.⁴⁷

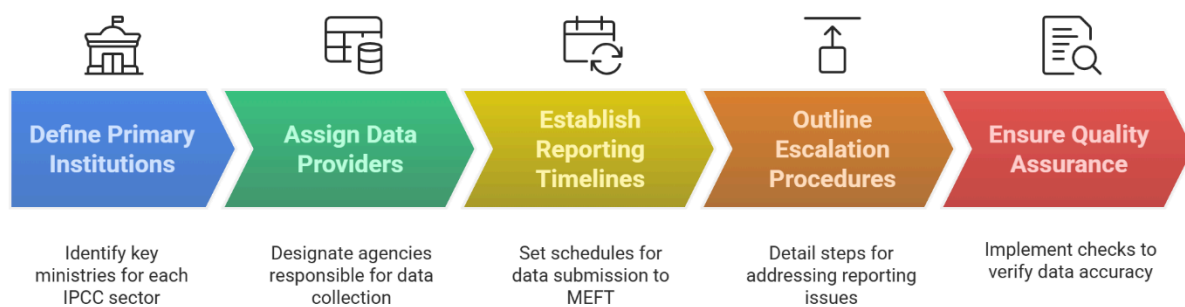


Figure 10. National Institutional Framework for Climate Reporting.

To enhance clarity and efficiency, Namibia should develop a National Institutional Framework for Climate Reporting, which would (Figure 10):

- Define primary and supporting institutions for each Intergovernmental Panel on Climate Change (IPCC) sector (e.g., Ministry of Mines and Energy for energy, Ministry of Agriculture, Water and Land Reform for agriculture, forestry, and other land use).
- Assign data providers and compilers, designating focal points within each agency.
- Establish reporting timelines and responsibilities, including data submission schedules to MEFT.
- Outline escalation procedures and quality assurance roles, ensuring that each step is monitored and verifiable.

This framework would formalize roles and responsibilities, reducing redundancies and improving data quality and timeliness.⁴⁸

⁴⁷ MEFT, *Namibia’s First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024).

⁴⁸ ICAT, *Unfolding the Reporting Requirements for Developing Countries Under the Paris Agreement’s Enhanced Transparency Framework* (UNEP DTU Partnership, 2019).

4.3.2 Establishment or Strengthening of a Central Coordinating Entity

Currently, the MEFT Climate Change Unit serves as the de facto coordinating body for climate reporting. However, this role lacks a clear legal mandate, dedicated staffing, and sufficient budgetary support, undermining its effectiveness.⁴⁹

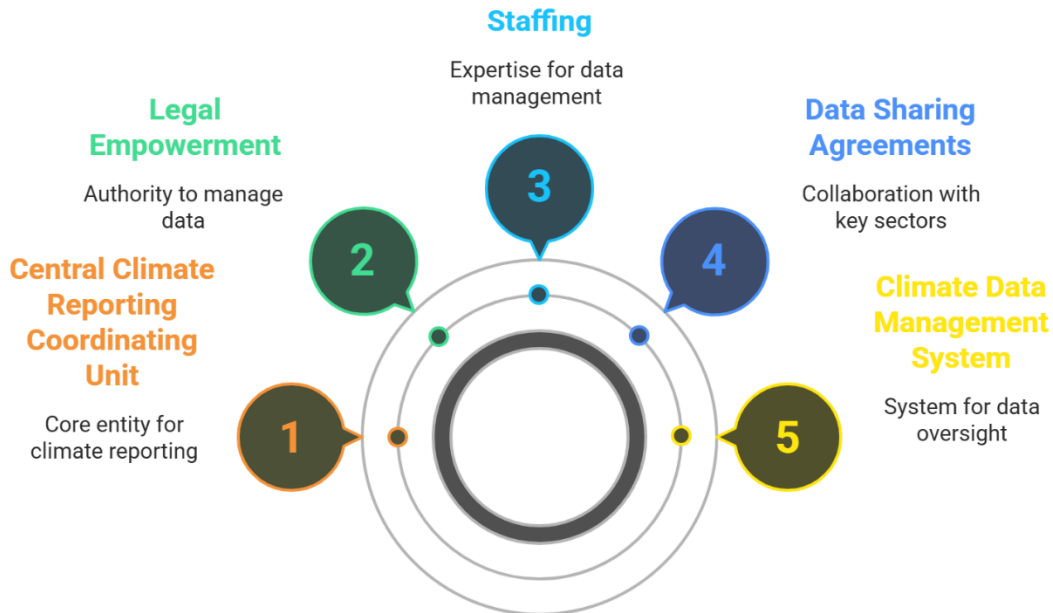


Figure 11. Central Climate Reporting Coordinating Unit.

Namibia should consider establishing a Central Climate Reporting Coordinating Unit, potentially within MEFT or under a cross-sectoral body like the National Planning Commission (Figure 11). This unit should be:

- Legally empowered to request, receive, and process sectoral data.
- Staffed with permanent personnel, including inventory experts, data analysts, and system managers.
- Linked with the NSA and key sectoral ministries through memoranda of understanding or data-sharing agreements.
- Responsible for managing the proposed Climate Data Management System (CDMS) and overseeing its institutional integration.

Such a centralized entity would enhance coordination, accountability, and sustainability of Namibia's climate reporting efforts.⁵⁰

⁴⁹ Government of Namibia, *Final Updated Nationally Determined Contribution (NDC)* (Windhoek: MEFT, 2023).

⁵⁰ ICAT Namibia, *NDC Tracking Framework for the Energy Sector: Terms of Reference* (MEFT and EIF, 2024).

4.3.3 Capacity Building Programs for Technical Staff

A significant barrier to effective climate reporting in Namibia is the limited technical capacity within key institutions. Many agencies lack in-house experts on greenhouse gas (GHG) estimation, IPCC software, or emissions modelling, relying instead on external consultants.⁵¹

To build and retain technical expertise, Namibia should implement a national climate reporting capacity-building program, encompassing:

- Annual training courses on GHG inventory methods, quality assurance/quality control procedures, IPCC software, and modelling tools.
- Hands-on workshops and peer exchanges, particularly for new inventory focal points.
- Technical internships and graduate placements within key ministries and the MEFT Climate Change Unit.
- Regional collaboration, leveraging programs from the Southern African Development Community (SADC) or African Regional Climate Centres.

These initiatives would foster a skilled workforce capable of sustaining and advancing Namibia's climate reporting capabilities.⁵²

4.3.4 Legal and Policy Recommendations

Namibia currently lacks comprehensive legislation that codifies institutional roles for emissions reporting, data sharing, or compliance with ETF obligations. While various policies reference climate transparency, there is no overarching legal framework governing climate data governance.⁵³

To address this gap, Namibia should:

- Draft a Climate Reporting Regulation, under the Environmental Management Act or a dedicated Climate Change Bill.
- Institutionalize data-sharing agreements through ministerial memoranda of understanding or executive directives.
- Integrate ETF requirements into the National Climate Change Policy, with explicit roles and budget allocations for key ministries.
- Align national statistical legislation with climate reporting needs, particularly concerning metadata standards and confidentiality protections.

Implementing these legal and policy measures would provide the necessary foundation for a robust and sustainable climate reporting system.⁵⁴

⁵¹ Government of Namibia, *First National Inventory Document (1990–2022)* (Windhoek: MEFT, 2024).

⁵² UNDP, *Namibia commences its reporting process aimed at strengthening policies and measures to climate change adaptation and mitigation* (2022).

⁵³ National Policy on Climate Change for Namibia (2011), Ministry of Environment and Tourism.

⁵⁴ UN-Habitat, *Assessment of Namibia Legislation through the Urban Law Module of the Law and Climate Change* (2022).

5 Roadmap for Implementation

The successful operationalization of Namibia’s climate transparency framework requires a structured and phased approach. This roadmap sets out short-term, medium-term, and long-term actions to enhance data quality, institutional arrangements, and sectoral engagement in line with the Enhanced Transparency Framework (ETF) of the Paris Agreement. Each phase is interconnected, progressively building toward a sustainable, nationally owned climate data and reporting system.

5.1 Short-Term (0–1 Year): Quick Wins and System Foundations

The focus in the first year is on initiating activities that require minimal financial resources, are administratively feasible, and can be implemented within the current institutional and technical capacity. These actions serve as foundational steps to enable larger reforms (Figure 12).

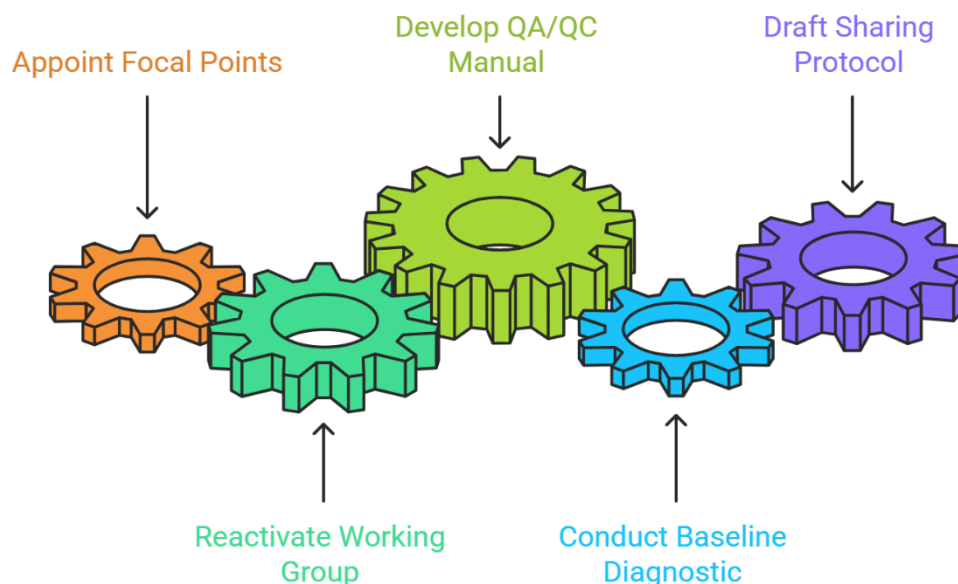


Figure 12. Climate Data Management Interventions (Short-Term 0–1 Year).

Key Interventions:

- **Formal appointment of institutional focal points and sector leads:** Each relevant ministry or agency (e.g., MME, MAWLR, MWT, ECB) should formally designate GHG inventory focal points responsible for compiling and sharing sectoral data. These appointments should be institutionalized via internal ministerial memos and integrated into job descriptions.⁵⁵
- **Reactivation or formalization of the National Climate Data Working Group:** This inter-agency coordination platform, chaired by MEFT, should meet quarterly to

⁵⁵ MEFT, *Namibia’s First Biennial Transparency Report and Fifth National Communication* (Windhoek: Government of the Republic of Namibia, 2024).

streamline data exchange, validate methodological assumptions, and monitor reporting progress.⁵⁶

- **Develop and pilot a National QA/QC Manual:** Using the IPCC Good Practice Guidelines, MEFT should prepare a QA/QC framework with practical checklists, standard operating procedures (SOPs), and logging templates.⁵⁷ This can be tested during the next GHG inventory cycle.
- **Conduct a baseline diagnostic of climate data systems:** This includes mapping existing datasets, data gaps, reporting cycles, data formats, and access protocols across ministries, public enterprises (e.g., NamPower), and municipalities. This exercise should inform system upgrades and data flow planning.⁵⁸
- **Draft and circulate a Climate Data Sharing Protocol:** This document would outline minimum data reporting standards, confidentiality agreements, data retention practices, and timelines for submission.

These measures are largely policy-oriented and procedural, and their implementation would greatly improve clarity, coordination, and readiness for deeper reforms.

5.2 Medium-Term (1–3 Years): System Development and Capacity Building

In this phase, the focus shifts to building institutional capacity, investing in technological systems, and formalizing tools and methods for emissions tracking and reporting (Figure 13). This will also lay the groundwork for ETF-aligned institutionalization.

⁵⁶ ICAT Namibia, *NDC Tracking Framework for the Energy Sector: Terms of Reference* (MEFT and EIF, 2024).

⁵⁷ IPCC, *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (Geneva: IPCC, 2000).

⁵⁸ Government of Namibia, *Final Updated Nationally Determined Contribution (NDC)* (Windhoek: MEFT, 2023).

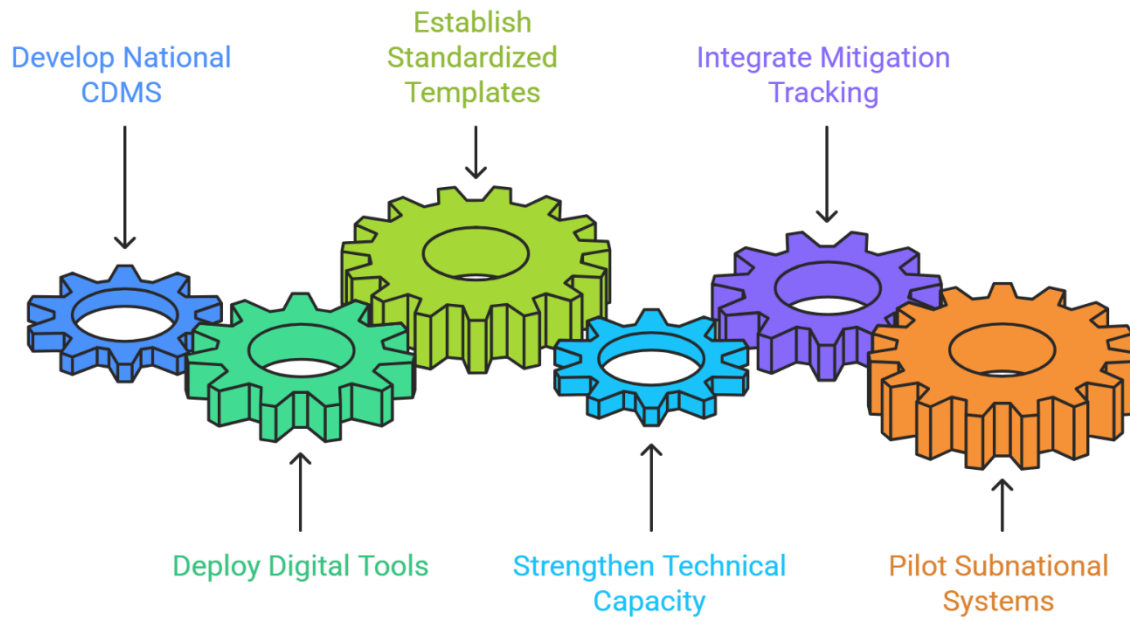


Figure 13. Climate Data Management and Mitigation Strategy (Medium-Term 1–3 Years).

Key Interventions:

- **Develop and operationalize a national Climate Data Management System (CDMS):** This centralized digital platform will house datasets, perform basic QA/QC checks, manage emissions inventory submissions, and support visualizations (e.g., through dashboards). It should have user-level access rights and be managed by MEFT.⁵⁹
- **Deploy digital tools for field-level data collection:** Tablets and mobile applications such as KoboToolbox or ODK should be used to collect data on energy use, land use practices, municipal waste, and renewable energy deployment. These tools can also feed into the CDMS in near real-time.
- **Establish standardized templates for sectoral data collection:** These templates will be harmonized across institutions, using consistent units, IPCC activity categories, and metadata fields (e.g., source, method, time stamp). They will reduce inconsistencies and improve data quality.
- **Strengthen technical capacity through continuous learning:**
 - Create an annual training calendar focused on inventory development, emissions modelling, data validation, and IPCC software.
 - Partner with national training institutions and regional organizations such as the SADC Climate Services Centre.
 - Encourage government-wide integration of capacity development in human resource strategies.
- **Integrate mitigation tracking into national development systems:** The CDMS and NDC tracking system should interface with planning tools like the National

⁵⁹ ICAT, *Unfolding the Reporting Requirements for Developing Countries Under the Paris Agreement's Enhanced Transparency Framework* (UNEP DTU Partnership, 2019).

Development Plans (NDPs), NIRs, and sectoral MIS platforms (e.g., ECB’s renewable energy registry).

- **Pilot subnational and sector-specific inventory systems:** Engage municipalities (e.g., Windhoek, Walvis Bay) and high-emitting private sector actors in developing localized GHG estimates and mitigation data collection pilots.

These investments will enable Namibia to move beyond episodic reporting to a regular, automated, and stakeholder-inclusive emissions tracking system.

5.3 Long-Term (3+ Years): Institutionalization and Sustainability

By year three and beyond, the goal is to embed climate data systems into national governance and regulatory frameworks, ensuring sustainability beyond individual projects or development partner support.

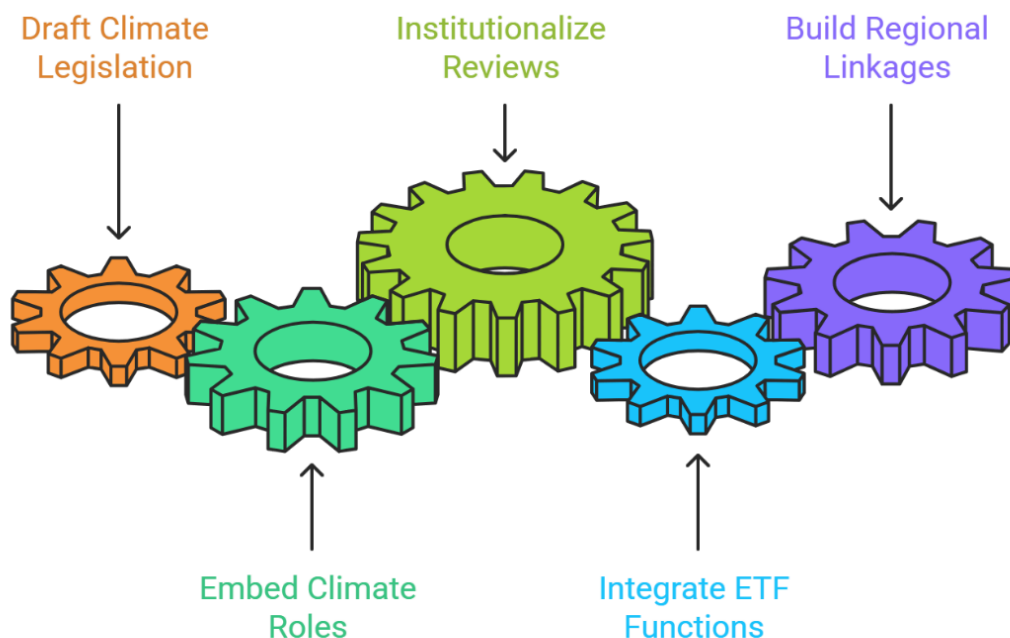


Figure 14. Climate Reporting Interventions (3+ years).

Key Interventions:

- **Draft and enact climate reporting legislation or regulation:** This could take the form of a standalone Climate Transparency Regulation or amendments to the Environmental Management Act. It should legally mandate sectoral reporting, define enforcement mechanisms, and ensure compliance with ETF obligations.⁶⁰
- **Embed climate reporting roles into public sector structure:**
 - Create permanent positions in MEFT, NSA, and line ministries for climate data specialists and GHG inventory officers.

⁶⁰ UN-Habitat, *Assessment of Namibia’s Climate Law Landscape under Urban Law Module* (2022).

- Ensure climate reporting is included in national and ministerial budget allocations (e.g., Medium-Term Expenditure Frameworks).
- **Institutionalize independent reviews and third-party verification:**
 - Include expert peer reviews as part of GHG inventory submissions.
 - Encourage periodic audits by academic institutions or international review bodies to strengthen transparency and comparability.
- **Integrate ETF functions into national planning frameworks:**
 - Ensure that data collection and mitigation tracking are linked to implementation of the National Climate Change Strategy and Action Plan (NCCSAP) and NDC Roadmap.
 - Embed emission baselines and trends into economic and environmental assessments.
- **Build regional and international linkages:**
 - Participate in South-South knowledge exchanges (e.g., via ICAT, CBIT, UNFCCC Regional Collaboration Centres).
 - Align reporting with regional environmental goals and Africa's ETF roadmaps to benefit from harmonized methodologies and funding access.

At this stage, Namibia will have transitioned to a mature, self-sustaining transparency framework, enabling the country to confidently report progress, attract finance, and inform ambitious policy.

6 Monitoring and Evaluation Plan

A dedicated Monitoring and Evaluation (M&E) system is essential to ensure that progress in strengthening data quality, institutional coordination, and reporting capacity is sustained and measurable. The M&E plan outlined below is designed to:

- Track progress against key data quality and governance milestones;
- Provide feedback loops for institutional learning and system improvement;
- Ensure compliance with ETF guidelines and national climate priorities.

6.1 Indicators for Tracking Improvements in Data Quality and Management

Table 3 defines a set of quantitative and qualitative indicators to monitor progress in strengthening climate data systems. Each indicator is tied to a specific output or outcome in Namibia's transparency framework and is linked to a target or benchmark.

- **Purpose:** To measure whether improvements in data quality, coverage, standardization, and institutional capacity are being realized.
- **Example:** The indicator “% of datasets with metadata and standardized formats” will show if Namibia's data is becoming more interoperable, which is crucial for automation and integration into digital systems like the Climate Data Management System (CDMS).
- **Responsible institutions** are clearly specified to support accountability.

These indicators will form the foundation of Namibia's climate data performance dashboard and feed directly into national reporting and internal performance assessments.

Table 3. Indicators for Tracking Improvements in Data Quality and Management.

Indicator	Definition	Target/Benchmark	Responsible Institution
% of priority sectors with formally designated inventory focal points	Tracks institutional assignment of reporting roles	100% of IPCC sectors (Energy, AFOLU, IPPU, Waste) by Year 1	MEFT with line ministries
Existence of a national QA/QC protocol	Tracks formalization of QA/QC process	Protocol adopted by Year 1 and updated annually	MEFT Climate Change Unit
% of datasets with metadata and standardized formats	Measures data interoperability and traceability	80% of sectoral datasets standardized by Year 2	NSA and MEFT

Indicator	Definition	Target/Benchmark	Responsible Institution
Functionality of Climate Data Management System (CDMS)	Assesses operational capacity of the national data platform	System launched by Year 2; fully functional by Year 3	MEFT, EIF, IT service provider
Number of trained staff in GHG methodologies and ETF reporting	Tracks institutional technical capacity	50+ trained staff across sectors by Year 3	MEFT, NSA, training partners
% of sectors submitting data on time for national reports	Evaluates efficiency of institutional data flows	≥90% submission rate by Year 3	MEFT, NSA

These indicators should be tracked through quarterly reports by the MEFT Climate Change Unit and validated annually through a transparency self-assessment.

6.2 Frequency and Method of Review

To maintain consistency, performance reviews should be conducted on a tiered basis, with varying depth depending on the type of review. Table 4 outlines the institutional schedule and methodology for reviewing progress, ensuring that M&E is embedded in the routine functioning of the transparency system.

- **Purpose:** To ensure that improvements in climate reporting are not only implemented but also regularly reviewed, refined, and aligned with international commitments.
- **Review types:**
 - **Quarterly Coordination Reviews** offer rapid assessments and allow for real-time course correction on data submissions.
 - **Annual Technical Reviews** assess the technical integrity of emissions estimates and identify systemic weaknesses.
 - **Midterm Evaluations** are more strategic, looking at overall institutional reforms, human resource development, and financial sustainability.
 - **External Verification** aligns Namibia's national system with UNFCCC expert review cycles, ensuring global comparability and transparency.

By separating reviews by depth and frequency, Namibia can optimize resources while maintaining continuous system vigilance.

Table 4. Frequency and Method of Review.

Review Type	Frequency	Scope	Lead Agency	Methodology
Quarterly Coordination Review	Every 3 months	Review of data submissions, coordination, QA/QC issues	MEFT	Working group meeting minutes; review matrix
Annual Technical Review	Once per year	Evaluate inventory completeness, QA/QC logs, system usage	MEFT, NSA	Independent technical team; reports validated against IPCC guidelines
Midterm Evaluation	Every 2–3 years	Evaluate institutional performance, legal/regulatory progress, training outcomes	MEFT with GEF/UNDP/ICAT support	Participatory evaluation; stakeholder interviews
External Verification	Every 5 years (aligned with BTR)	Review of reported GHG data, mitigation tracking, and support received	Third-party reviewers (e.g., UNFCCC)	ETF/BTR peer review process

Review findings should feed into updates to Namibia’s NDC tracking framework, National Communications (NCs), and the Climate Change Strategy and Action Plan.

6.3 Feedback and Continuous Improvement Mechanisms

To promote adaptive management and system evolution, Namibia should institutionalize feedback loops and corrective action plans (Table 5):

Table 5. Feedback and Continuous Improvement Mechanisms.

Mechanism	Purpose	How It Works	Responsible Entity
GHG Inventory Improvement Plan (NIIP)	Documents recurring data gaps and proposed improvements	Updated after each inventory cycle; shared with all contributors	MEFT
Feedback Surveys	Capture experiences of data providers,	Conducted online post-reporting period; results summarized and	NSA, MEFT

Mechanism	Purpose	How It Works	Responsible Entity
	analysts, and reviewers	discussed in coordination meetings	
QA/QC Error Logs and Corrective Logs	Track specific data anomalies and how they were addressed	Maintained in CDMS with alerts and resolution timelines	Sectoral focal points
Training Impact Reviews	Evaluate effectiveness of capacity building programs	Baseline and follow-up tests; feedback sessions; performance tracking	MEFT and partners (e.g., ICAT, UNDP)

Table 5 introduces structured tools to capture lessons learned and foster adaptive management. It builds institutional memory and supports iterative improvements based on experience and feedback.

- **Purpose:** To institutionalize a learning loop, whereby technical teams and data providers can document challenges, propose solutions, and refine procedures for future cycles.
- **Tools include:**
 - **Inventory Improvement Plans (NIIPs)** that document data gaps, uncertainties, and methodological issues—critical for advancing from Tier 1 to Tier 2/3 inventory methods.
 - **Feedback Surveys** that gather insights from technical teams and sectoral contributors on the user-friendliness, clarity, and challenges encountered in the reporting cycle.
 - **Error and Corrective Logs** serve as quality control history, documenting issues such as misreported units or out-of-range values, and how these were addressed.
 - **Training Impact Reviews** assess the return on investment from capacity-building efforts, helping refine training content and approaches.

These mechanisms ensure Namibia can adapt its climate data systems in response to new challenges, emerging best practices, and international reporting requirements.

6.4 Suggested Implementation Timeline (Excerpt)

The timeline in Table 6 synthesizes the sequence of activities across Years 1 to 5, aligning institutional reforms, digital tool deployment, and performance monitoring into a coherent schedule.

- **Purpose:** To provide a clear and phased vision for implementing Namibia’s climate data reforms in a manageable and strategic manner.

- **Structure:**
 - **Year 1** focuses on organizational reforms (focal points, working groups).
 - **Year 2** launches core systems like the CDMS and begins full-scale M&E implementation.
 - **Year 3** consolidates progress and evaluates midterm outcomes.
 - **Year 5** represents a critical milestone: readiness for full external review aligned with the Biennial Transparency Report (BTR) cycle.

Table 6. Suggested Implementation Timeline.

Year	Key M&E Milestones
Year 1	Appoint focal points; adopt QA/QC protocol; begin quarterly reviews
Year 2	CDMS launched; first annual review; M&E indicators populated
Year 3	Midterm evaluation; >50 trained staff; first NIIP developed
Year 5	Full external ETF review; long-term indicators assessed

Table 6 enables government planners, donors, and stakeholders to align resources, timelines, and technical assistance around key milestones.

7 Conclusion

As Namibia intensifies its efforts to implement the Enhanced Transparency Framework (ETF) under the Paris Agreement, this report presents a clear and actionable pathway to improving climate data quality, strengthening institutional arrangements, and building a resilient national transparency system. The proposed strategies respond directly to the findings of the *First Biennial Transparency Report (BTR1)*, the *Final Updated NDC (2023)*, and insights from the ICAT-supported NDC tracking initiative.

7.1 Main Recommendations

a) Data Quality Improvement

- Adopt and institutionalize a national QA/QC protocol aligned with IPCC standards.
- Standardize data formats, units, and metadata across all climate-relevant datasets.
- Introduce automated validation and verification procedures in national data workflows.

b) Data Collection Strengthening

- Develop routine, sector-specific data collection methodologies integrated into line ministry functions.
- Deploy digital tools such as mobile survey apps, sensors, and online dashboards to improve coverage and timeliness.
- Expand data collection in underreported sub-sectors (e.g., off-grid energy, informal transport, decentralized agriculture).

c) Institutional Coordination

- Clearly define the roles and mandates of all data-generating institutions and formalize responsibilities through MoUs.
- Establish a legally mandated central coordination unit within MEFT with budgeted staff.
- Build technical capacity through continuous training, staff retention strategies, and inter-institutional knowledge exchange.

d) Policy and Legal Foundations

- Draft a climate reporting regulation to mandate ETF-aligned data sharing, inventory development, and reporting cycles.
- Integrate transparency objectives into national climate policy, development plans, and statistical legislation.

e) Monitoring, Evaluation, and Feedback

- Implement a national M&E framework with indicators, review cycles, and feedback loops.
- Use tools such as the Climate Data Management System (CDMS), Inventory Improvement Plans (NIIP), and technical review scorecards to measure progress and drive continuous improvement.

f) Roadmap Implementation

- Sequence reforms into short-, medium-, and long-term actions that progressively build a robust, nationally owned reporting system by 2030.

In summary, the report’s recommendations are depicted in Figure 15.



Figure 15. Building a Robust Climate Reporting System.

The roadmap presented in this report is visually summarized in Figure 15, which illustrates the six interconnected pillars required to strengthen Namibia’s climate transparency system by 2030. The pathway begins with Data Quality Improvement, which focuses on enhancing the reliability and standardization of emissions and activity data through QA/QC protocols, metadata standards, and validation procedures. It progresses into Data Collection Strengthening, where the emphasis shifts to expanding and modernizing data gathering methods—especially through the use of digital tools, mobile platforms, and decentralized systems.

The third milestone, Institutional Coordination, underscores the need to clearly define mandates, reporting roles, and responsibilities among ministries, agencies, and

stakeholders. This is followed by the establishment of Policy and Legal Foundations, recommending the development of climate data legislation or regulatory instruments that formally institutionalize transparency requirements. Next, the roadmap highlights the importance of Monitoring and Evaluation, emphasizing the creation of systems and indicators to track progress, promote accountability, and enable continuous improvement. Finally, the roadmap culminates in Roadmap Implementation, where Namibia is expected to execute this phased strategy, progressively achieving a robust, nationally owned climate data system that meets international reporting standards by 2030.

Figure 15 serves as a concise summary of the sequencing and integration of recommendations, reinforcing the importance of treating data quality, coordination, legal structure, and capacity building as mutually reinforcing components of a sustainable transparency framework.

7.2 Conclusion - Empowering Institutions for Long-Term Impact

The success of Namibia’s transparency framework hinges on the full engagement and collaboration of all national stakeholders as shown in Figure 16. The diagram above illustrates a coordinated national effort, placing MEFT and the Government of Namibia at the centre, while emphasizing the distinct but interconnected roles of key actors across sectors and governance levels.

At the core of this system is the Ministry of Environment, Forestry and Tourism (MEFT), serving as the national lead for climate reporting. MEFT is responsible for coordinating transparency processes, managing national submissions to the UNFCCC, and ensuring alignment with the Enhanced Transparency Framework (ETF).

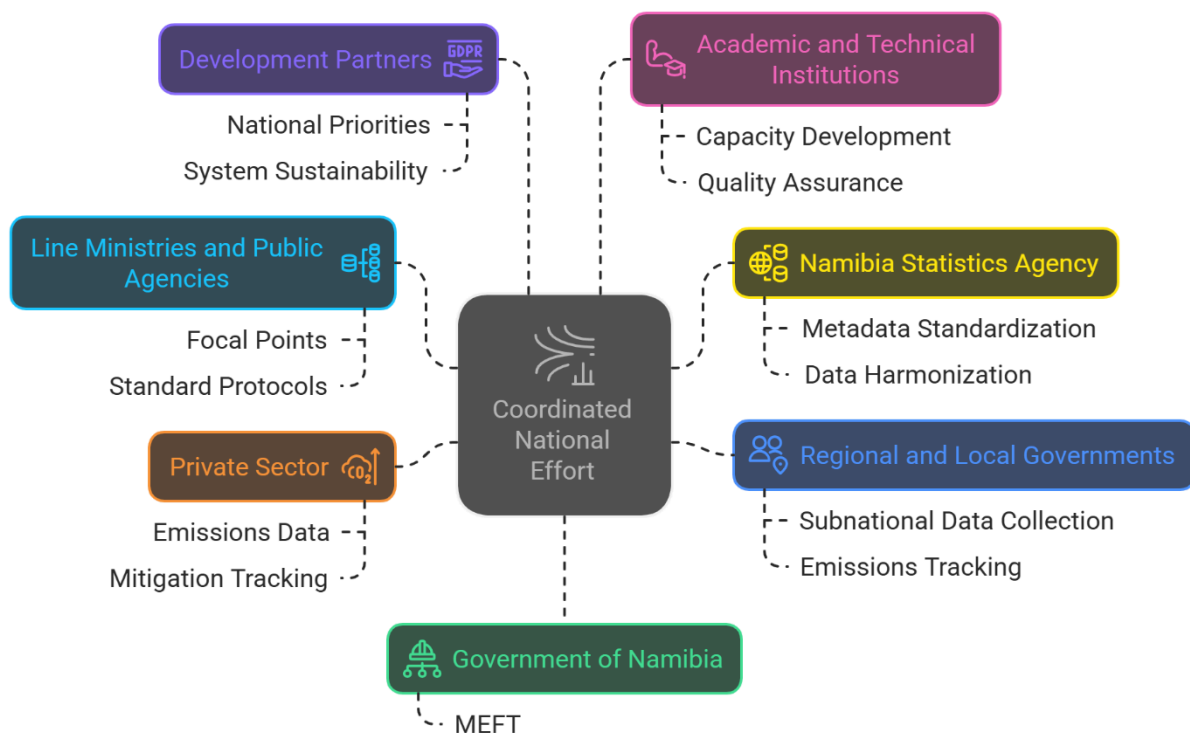


Figure 16. Coordinated National Effort for Climate Data Management.

Surrounding MEFT are a range of essential contributors:

- **Line Ministries and Public Agencies** must appoint sectoral focal points, adopt standardized protocols, and systematically generate activity data across IPCC sectors. Ministries such as Mines and Energy, Agriculture, and Works and Transport play particularly critical roles in emissions estimation and mitigation data provision.
- The **Namibia Statistics Agency (NSA)** provides the backbone for metadata standardization and data harmonization, ensuring that socio-economic and sectoral datasets are compatible and traceable across the system.
- **Regional and Local Governments** are increasingly central to transparency. They are called upon to collect and report **subnational emissions data**, particularly from sectors such as waste, transport, and decentralized energy use.
- The **Private Sector** must engage in sharing emissions and energy consumption data, especially large emitters and independent power producers. Their participation is key to building a comprehensive national GHG inventory and enabling mitigation tracking.
- **Academic and Technical Institutions** are critical for capacity development and quality assurance. Their role includes training public officials, supporting the development of national methodologies, and serving as peer reviewers in inventory processes.
- **Development Partners** play an enabling role in ensuring that national priorities are reflected in external support, and that investments in transparency systems are both targeted and sustainable.

Together, these actors must operate within a unified framework that promotes data interoperability, role clarity, and continuous collaboration. The diagram (Figure 16) reinforces that climate transparency is not the responsibility of a single ministry or project—it is a shared national mandate, requiring integrated action from government, civil society, the private sector, and the international community.

This coordinated effort will ensure that Namibia not only complies with global reporting obligations but also builds a resilient national system that informs planning, strengthens governance, and unlocks climate finance.

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Annexes

Annex A. Glossary of terms

Term	Definition
AFOLU	Agriculture, Forestry, and Other Land Use – a major GHG source category in the IPCC inventory framework.
Biennial Transparency Report (BTR)	A mandatory report under the Paris Agreement where countries communicate GHG inventories, NDC progress, and support received.
Capacity Building Initiative for Transparency (CBIT)	A global fund and technical support mechanism established to assist developing countries in meeting ETF requirements.
Climate Data Management System (CDMS)	A centralized digital platform proposed for Namibia to manage, store, validate, and report climate-related data.
Enhanced Transparency Framework (ETF)	A reporting system under the Paris Agreement that mandates all Parties to regularly report on climate action in a transparent, accurate, and consistent manner.
GHG Inventory	A structured accounting of greenhouse gas emissions and removals by sources and sinks, typically aligned to IPCC Guidelines.
Greenhouse Gas Abatement Cost Model (GACMO)	A tool used to assess mitigation potential and cost-effectiveness of climate actions.
Institutional Arrangements	The formal and informal structures, roles, mandates, and coordination mechanisms among government entities responsible for climate data.
IPCC Guidelines	Methodologies and procedures developed by the Intergovernmental Panel on Climate Change for compiling national GHG inventories.
Inventory Improvement Plan (NIIP)	A document that identifies gaps, weaknesses, and recommendations for improving national GHG inventories.
KoboToolbox / ODK	Open-source digital platforms used for mobile-based data collection, especially in field-based surveys.
Metadata	Information that describes the content, origin, format, and structure of data to improve transparency and traceability.

Ministry of Environment, Forestry and Tourism (MEFT)	The lead institution for climate change policy and GHG inventory coordination in Namibia.
Mitigation	Measures taken to reduce or prevent greenhouse gas emissions, including energy efficiency, renewable energy, and sustainable land use.
Modalities, Procedures, and Guidelines (MPGs)	Technical guidance adopted by the UNFCCC on how countries should implement the ETF.
Namibia Statistics Agency (NSA)	The national body responsible for official statistics, including energy balances and socioeconomic indicators relevant for emissions calculations.
National Communications (NCs)	Periodic reports submitted by countries to the UNFCCC outlining climate action, vulnerabilities, and support needs.
National Determined Contribution (NDC)	A country's stated commitments under the Paris Agreement to reduce emissions and enhance resilience.
QA/QC (Quality Assurance/Quality Control)	A set of procedures and checks to ensure the integrity, transparency, and accuracy of climate data.
Subnational Reporting	Data and emissions reporting conducted by local or regional authorities below the national level.
Tier Methods	Levels of methodological complexity in IPCC Guidelines, with Tier 1 using default data and Tier 2/3 incorporating country-specific or detailed datasets.
UNFCCC	United Nations Framework Convention on Climate Change – the international treaty guiding global climate action.

Annex B. Stakeholder consultation summary

This annex documents the consultation processes carried out during the development of the report, ensuring compliance with participatory principles under the ETF.

Consultation Type	Participants	Date	Key Themes Discussed
Technical Working Group Meeting	MEFT, NSA, MME, ECB, MAWLR	August 2024	Institutional roles, QA/QC needs, data gaps
Stakeholder Workshop	Municipalities, NGOs, academic institutions	December 2024	Subnational data flows, training needs, data access
ICAT Validation Workshop	Government, development partners, consultants	March 2024	CDMS structure, indicator framework, roadmap feedback

Outcomes of these consultations informed the formulation of institutional roles, data quality improvements, and the M&E framework presented in this report.