

Barrier Assessment for MRV/ETF in Botswana's energy sector



Initiative for Climate Action Transparency – ICAT Barrier Assessment for MRV/ETF in Botswana’s energy sector

Deliverable #4

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Acronyms

BTR	Biennial Transparency Report
BUAN	Botswana University of Agriculture and Natural Resources
COP	Convention of parties
DFRR	Department of Forestry and Range Resources
DMS	Department of Meteorological Services
ETF	Enhanced Transparency Framework
ICAT	Initiative for Climate Action Transparency
INDCs	Intended Nationally determined contributions
GDP	Gross domestic product
GHG	Greenhouse gases
GoB	Government of Botswana
NDC	Nationally determined contributions
NDP	National development plan
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MRV	Measuring, reporting, and verification



MPGs	Modalities, procedures, and guidelines
PV	Photovoltaic
QA	Quality assurance
QC	Quality control
SES	Stakeholder's engagement strategy
ToR	Terms of reference
UB	University of Botswana
UNFCCC	United Nations Framework Committee on Climate Change

Introduction

The Paris Agreement is a climate change international treaty signed by 196 parties at COP 21 in Paris in December 2015. The goal of the Paris Agreement is to limit global warming to below 2 °C or better 1.5 °C compared to the pre-industrial levels. Limiting global warming to the Paris Agreement target hinges on reducing global greenhouse gas (GHGs) emissions. The GHG emissions reduction will be achieved through the Nationally determined contributions (NDCs). Articles 4, 7, 9, 10, 11 and 13 require the parties to develop the NDCs detailing their mitigation efforts and potential emission reduction contributions and communicate these efforts to the United Nations Framework Convention on Climate Change (UNFCCC). The NDCs are to be communicated every five years (UNFCCC, 2020). Subsequently, NDCs are the tangible instruments to achieve the Paris Agreement goals.

One highlight of the Paris Agreement is the establishment of the enhanced transparency framework (ETF). Consequently, transparency is a critical element of the NDCs, and parties are requested to include relevant information to facilitate clarity, transparency and understanding of their actions (UNFCCC, 2020). Thus, for this reason, decision 4/CMA.1 para 7 urged parties to include the necessary information to enhance and facilitate clarity and transparency on the updated NDCs by 2020 (UNFCCC, 2020).

The Government of Botswana (GoB) communicated its Intended Nationally Determined Contributions (INDCs) as per decision i/CP.19 and 1/CP.20 in 2015, which was adopted as NDCs in 2016. As per the Paris Agreement, which requires parties to submit the next round of updated NDCs by 2020, the GoB updated its NDC. The NDC covers both the mitigation and adaptation actions. The NDC mitigation efforts for Botswana are more energy inclined and cover approximately 15 mitigation measures.

Various initiatives have been established to assist the developing countries in achieving the ETF requirements. For example, the Initiative for Climate Action Transparency (ICAT) assists developing countries to build their capacity to measure and report their NDC efforts and ensure transparency, effectiveness, and trust.

Consequently, the GoB has solicited technical assistance from the ICAT to build capacity at institutional levels and strengthen their institutional arrangements to enhance the country's MRV/ETF system. Importantly, the assistance covers the development of the NDC tracking tools in accordance with the MPGs. Consequently, the GoB endeavours to report its NDC efforts in conformity to the Paris Agreement Transparency Framework.

To facilitate improved MRV systems for the NDC that will transit into ETF, it is fundamental that barriers and gaps that inhibit reporting the GHG emissions and mitigation reduction in a transparent manner that fosters trust are identified and removed. Subsequently, this report is part of the ICAT for the Energy sector for the GoB. The project's overall objective is to develop and enhance the capacity of the GoB to measure the impacts of its national policies and report progress publicly, thus fostering greater transparency, effectiveness, trust, and ambition in climate policies globally. This report thus discusses the barriers and gaps in the country's MRV and makes recommendations to remove barriers.

Objectives of the report

The main objective of this report is to undertake an assessment of the barriers and challenges for the country and make recommendations for the country to achieve the Paris Agreement Transparency Framework.

The specific objectives that have been achieved by the past deliverables and will thus contribute to achieving this objective are:

- Undertake MRV needs and gaps assessment report.
- Provide an analysis on the recommendation to strengthen the institutional arrangements for coordination of the national MRV/transparency system.

Methods and approaches

Two main methods were employed to achieve the main objective of this assignment (undertake an assessment of the barriers and challenges for the country in achieving the Paris Agreement Transparency Framework and make a recommendation). The first method was desk review. Desk review involved reviewing the national communications submitted to the UNFCCC, the NDCs, national development plans (NDP), climate change strategies and plans. These documents were reviewed to identify the barriers, challenges, and gaps. Furthermore, recommendations were also drawn from these reports.

The second method employed is stakeholders' consultation. This is an important method as it gives first-hand information on challenges, gaps, and recommendations. The responses from the past consultations were used to identify the barriers and gaps. The specific deliverables where consultation was undertaken are:

- Report on situational analysis on MRV mechanisms in the relevant institutions and relevant climate change data and information currently generated, also taking the information's quality and frequency into consideration and which gaps exist
- Report consolidating the inter-institutional consultations and policy/strategy analysis, the method and summary of each consultation and analysis

A consultation was undertaken based on guiding questions covering the various thematic areas of the ETF. The key stakeholders across the line-ministries departments and the private sector were consulted.

Paris Agreement Enhanced Transparency Framework

In order to analyse and assess the barrier to the NDC MRV systems it is crucial that the Paris Agreement Enhanced Transparency Framework is discussed regarding what the party members are expected to do. This will identify the requirements and whether the GoB has those prerequisites. Based on the Paris Agreement Enhanced Transparency Framework requirements, the barriers and challenges that impede the GoB to achieve the ETF were identified.

One of the important aspects of the PA is the transparency framework which aims at tracking the party members' efforts transparently. The transparency framework seeks to build mutual trust and confidence in tracking the Parties' efforts as defined in the parties' NDCs. In the Paris Agreement, member states developed and established ETF. Under the established ETF, countries agreed to start reporting transparently on their NDC mitigation, adaptation, and support received. Ultimately, the information obtained from the ETF platform will be used to assess the global efforts in achieving the set target and remove ambiguity in the GHG emissions efforts.

The purpose of the ETF, as outlined in article 13, are to

- "Provide a clear understanding of climate change action in the light of the objective of the Convention as set out in its Article 2, including clarity and tracking of progress towards achieving Parties' NDCs under Article 4 of the Paris Agreement "(from now on referred to as NDCs)
- "Provide clarity on support provided and received by relevant individual Parties in the context of climate change actions under Articles 4, 7, 9, 10 and 11, and, to the extent possible, to provide a complete overview of aggregate financial support provided, to inform the global stocktake under Article 14 "(UNFCCC, 2020: p8).

The COP established the modalities, procedures, and guidelines (MPGs) for the ETF, which each party must adhere



to when submitting its Biennial Transparency Report.

The ETF calls for a biennial transparency report which includes the GHG inventory, tracking the progress of implementation and achievement of NDC under Article 4. In addition, the financial, technology development and transfer, and capacity-building support provided and mobilized and received are to be tracked and reported (UNFCCC, 2020). **Error! Reference source not found.** depicts the ETF framework that the parties collectively agreed upon.

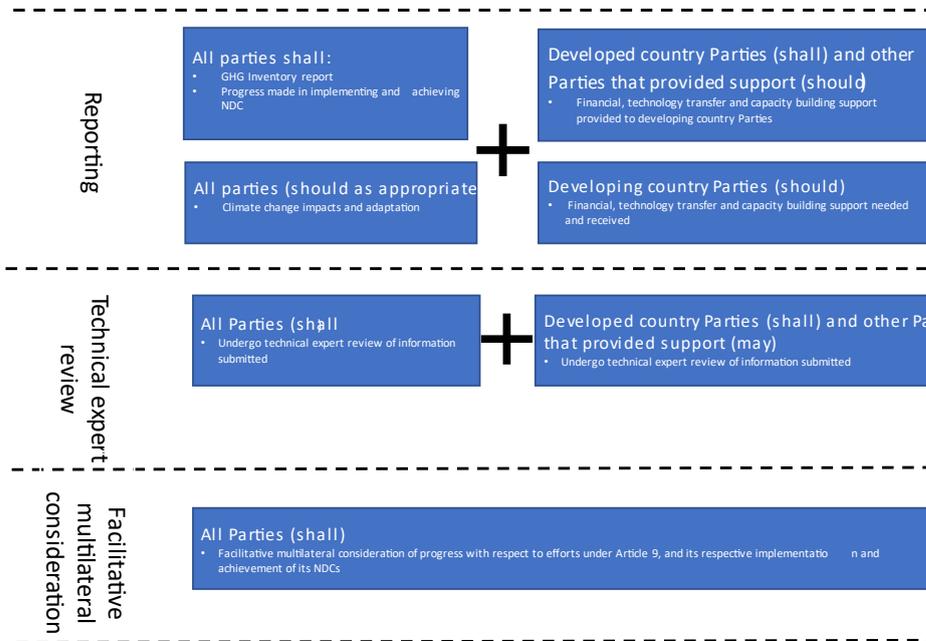


Figure 1: Framework for ETF. Adapted from UNFCCC

The reporting of the NDC will follow the UNFCCC schedule every five and two years for compliance, and its accounting system will be as per the layout in **Error! Reference source not found.** below.

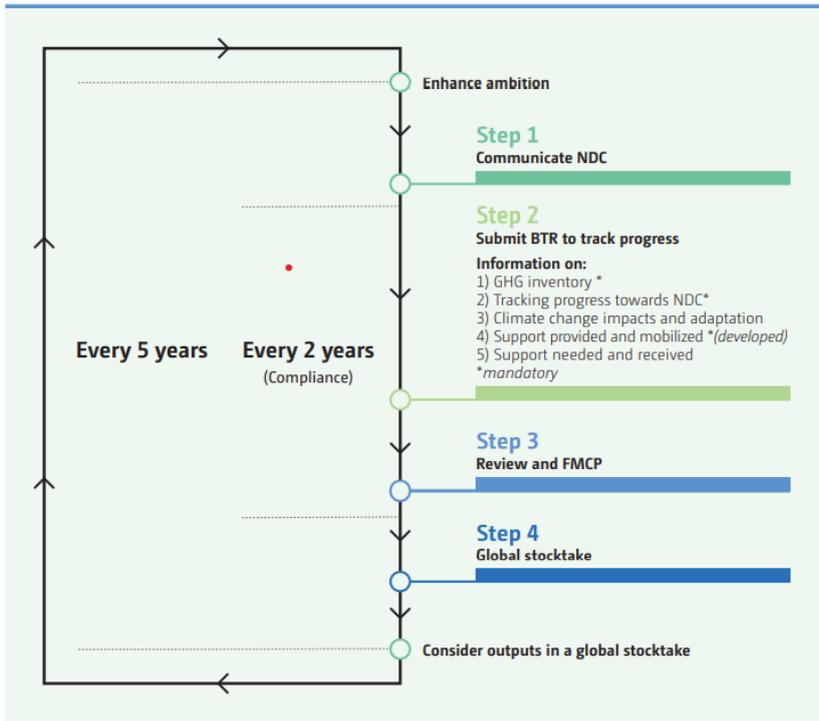


Figure 2: NDC reporting cycle. Source: UNFCCC (2020)

According to the ETF, Parties must have national inventory arrangements, including institutional, legal and procedural arrangements, to support the continued estimation, compilation and timely preparation and submission of their national inventory reports (UNFCCC, 2020). Importantly, all the information used to prepare GHG inventory must be archived, including all disaggregated emission factors and activity data, all documentation on generating and aggregating data, including QA/QC, review results and planned inventory improvements.

Furthermore, COP agreed under the Paris Agreement that the BUR would be discontinued and replaced by the Biennial Transparency Report (BTR). It is projected that the BTR will be submitted by 2024. Information that will be contained in the BTR is depicted in Figure 3.

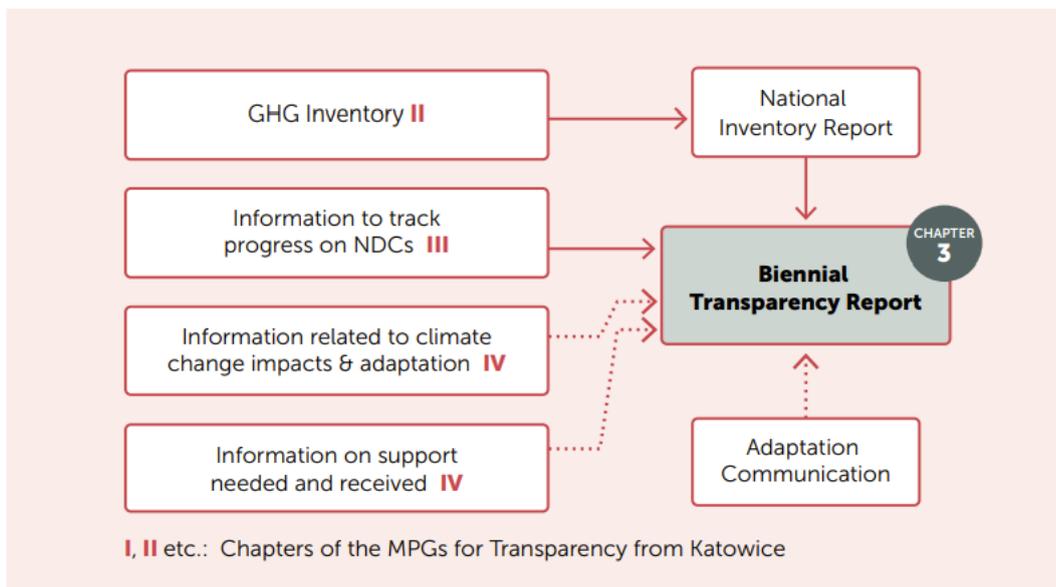


Figure 3: Information on BTR. Source ICAT (2019)

According to the UNFCCC, the reporting must be narrative and tabular. Parties must identify the indicators that must be used to track the progress made in the implementation and achievement of their NDC (UNFCCC, 2020). Possible indicators include but are not limited to the following:

- Net GHG emissions and removals,
- Percentage reduction of GHG intensity,
- Relevant qualitative indicators for a specific policy or measure,
- Mitigation co-benefits of adaptation actions and/or economic diversification plans,
- (e.g., hectares of reforestation, percentage of renewable energy use or production,
- carbon neutrality,
- Share of non-fossil fuel in primary energy consumption and non-GHG related indicators.

With this brief highlight of the MRV/ETF, the barriers and challenges that will hinder the country are identified and discussed below.

Identified barriers to NDC MRV systems

Based on the consultation with the stakeholders and desk review, barriers and challenges were identified. The barriers ranged from the stakeholders' limited knowledge of the NDC and Paris Agreement and weak institutional arrangement on data and information exchange to institutional capacities to track their NDC mitigation efforts. These challenges and barriers are discussed below.

Limited knowledge of the NDC and the Paris Agreement

One of the immediate barriers to implementing the Paris Agreement Transparency Framework is limited knowledge of the country's NDC and the Paris Agreement Transparency Framework. Most of the institutions consulted indicated limited knowledge of the country's NDC and the Paris Agreement Transparency Framework. The limited knowledge of NDC and the Paris Agreement Framework will invariably incapacitate the institutions to participate appropriately in reporting their mitigation measures and report as per the Transparency framework. Whilst the development of the country's NDC involved consultations with a wide range of stakeholders to identify feasible and viable mitigation measures, it appears institutions have limited institutional memory of the country's NDCs. This could be because stakeholder consultations might have been conducted on a limited number of people who would later retire or transfer to another department or district. Even if the consulted personnel have not retired, it could imply that knowledge of the NDC within the institution is limited to certain individuals, thus creating limited institutional knowledge of the NDC.

Regarding the Paris Agreement, the feedback from the stakeholders appears to indicate that most institutions have limited to no knowledge of the Paris Agreement and its Transparency Framework. Subsequently, this will limit the institutions to participate and provide the necessary information for tracking the NDC mitigation national efforts, and support received transparently with a high level of confidence and clarity.

Lack of institutional capacity

Tracking the NDC mitigation efforts at the institutional level, which will transit to the national level, requires institutional capacity in terms of skills and resources. The skill required includes data collection and analysis to estimate the GHG emissions potential reduction for the mitigation measures consistent with IPCC guidelines for GHG national inventory. Most of the institutions under which the NDC mitigation falls indicated limited knowledge

and skills in undertaking the GHG national inventory consistent with the IPCC methodology. This will limit the institutions to participate in the NDC tracking in a transparent manner and provide necessary information for clarity. In addition, most of the institutions have multiple priorities, and given the limited workforce, they are likely to prioritise their national mandates. In addition, the institutions lack tools that aggravate their institutional capacity to fulfil the ETF. The availability of tools to track NDC mitigation efforts will greatly improve the institutional capacities to report the mitigation efforts in a transparent manner. Thus, a combination of limited institutional skills and lack of available tools contribute to limited or lack of institutional capacity to undertake the NDC and report them consistently in accordance with the MPGs.

Lack of data and gaps in energy mitigation measures

The country's NDC mitigation for the energy sector covers approximately 15 mitigation measures constituting solar appliances, photovoltaic (PV) power stations and energy savings through retrofitting. Subsequently, a lot of data is needed regarding the number of appliances (solar streetlights, solar geysers), their energy-saving, the renewable energy generated and the reduction of GHG emissions. It is important that the generated data is of good quality and reliable. Some of the mitigation measures will be difficult to track with a high confidence level. For instance, the use of solar geysers is one mitigation measure that has been in place for some time. Obtaining the data for the geyser is difficult as the private sector mostly holds it. The records for the individuals who have installed the solar geysers are difficult to access. Secondly, the discussions with the government officials indicated that the public/government residential houses are installed with solar geysers. However, in many instances, they are not functioning due to a lack of expertise, which results in the installation of electric geysers.

For the streetlights, it will be difficult to track those that are operational and damaged due to the high incidence of vandalism on the streetlights. Consultation with the stakeholders thus reveals that one of the biggest challenges for the country in meeting the ETF is the ability to collect high quality and reliable data, especially on mitigation interventions.

Weak institutional arrangements on data and information exchange

The strong institutional arrangement facilitates data and information exchange which is vital for tracking the NDC in a transparent manner (Elsayed, 2013; UNFCCC, 2020). Well-defined institutional arrangements enhance and facilitate information exchange and reporting across the implementing entities (line ministries, private sector, communities, etc.) involved in the country's NDC. According to UNFCCC (2020), the key components of institutional arrangements include:

- Defined organizational mandates,
- expertise,
- data flows,
- systems and tools; and,
- stakeholder engagement.

The assessment of the institutions indicates that there are no defined organisational mandates concerning NDC tracking and reporting because there are no established terms of reference (ToRs) for the institutions involved in the NDC mitigation implementation. The ToRs generally define the institutions' roles and responsibilities as far as the Paris Agreement Transparency Framework is concerned. Additionally, defined ToRs are critical as they facilitate the responsibilities' engagement and ownership. Furthermore, it fosters and strengthens transparency and clarity in the way the data was collected and analysed.

Moreover, the institutions have limited knowledge of the NDC and the Transparency Framework. This will inhibit the institutions' inclusion in the NDC tracking and achieving the requirements of the Transparency framework. As per the UNFCCC, one of the essential elements of an effective institutional arrangement is the availability of systems and tools developed for tracking and reporting the NDC. However, currently, the country has not developed the

tools for the institutions to measure the mitigation capacities, their GHG emissions reduction potential, and the support received (finance and technology transfers).

Nevertheless, it is important to report some institutional arrangements in place for information and data exchange. Statistic Botswana is the lead agency in the National Statistics System. To facilitate data collection across the line ministries, Statistics Botswana has attached its employees in most line ministries (departments). Thus, Statistics Botswana is the central agency that will play a central role in data and information exchange for the NDC reporting. However, as indicated, the role of Statistics Botswana needs to be clearly defined by the ToRs.

Limited trained personnel on the GHG inventory

Discussion with the various energy stakeholders identified limited trained personnel for the IPCC National GHG Inventory procedures as another challenge. The institutions indicated the need to have trained personnel on IPCC national GHG emissions inventory. Furthermore, the stakeholders indicated a lack of capacity for MRV and the ETF. Consequently, the limited trained personnel on GHG inventory and estimating the mitigation efforts will inhibit the institutions from undertaking ETF requirements. Currently, the country has a GHG inventory team which is limited to five institutions, including Botswana University of Agriculture and Natural Resources (BUAN), Department of Meteorological Services (DMS), Statistics Botswana, University of Botswana (UB), Department of Forestry and Range Resources (DFRR). Within these institutions, the energy sector constitutes the majority of the NDC mitigation measures but has only three trained persons at the UB, BUAN and Statistics Botswana. On the other hand, the NDC mitigation measures cover the private sector, line ministries such as the housing sector, councils, agriculture, and water sector. This is a huge gap in available skills, which is restricted to tertiary institutes and Statistics Botswana.

Absence of nationally approved tracking tools to report on mitigation measures

According to the UNFCCC handbook on the institutional arrangement, supporting MRV transparency, systems, and tools is fundamental to enhancing MRV/ETF. Consultation with the stakeholders consistently indicated that one of the major challenges to implementing the MRV/ETF is the lack of the tracking tools they can be trained on and employ for tracking the NDCs. Stakeholders emphatically indicated that the absence of the tracking tools invariably implies that it will be difficult for them to track and report their mitigation measures. They noted that it would be easier to implement and track the MRV/ETF with the availability of the tools.

Low involvement and participation of the private sector

The NDC mitigation measures for the energy sector are dominated by measures that will involve the participation of the private sector, particularly domestic solar geysers, household PV systems, and solar boreholes. The data requirements for tracking these mitigation measures will require full participation and involvement of the private sector. Consultation with the stakeholders indicates that the private sector involvement in the NDC is extremely low. The lack of private sector involvement will hinder the flow of reliable data from the stakeholders. The consultation further reveals that due to the limited involvement of private sectors, such as suppliers of solar appliances, installers and the users (farmers), it would be difficult to access good quality and reliable data.

Lack of financial resources

Financial resources in developing countries such as Botswana are limited, while the developmental needs are unlimited. The country is faced with many challenges, including implementing climate change adaptation measures with priorities areas being water, food production and security, health issues and education. Invariably, it means that the limited financial resources will be prioritised on adaptation over mitigation to safeguard livelihoods and economic growth. NDC tracking will undoubtedly require additional financial resources in terms of human resources to set up data capturing and exchange systems and build capacity for data management, processing, and reporting. Furthermore, data quality control/quality assurance (QC/QA) measures need to be implemented to ensure consistency with the QC/QA framework as described in the IPCC Guidelines. All these activities will require additional financial resources and create a financing gap for the NDC implementation and tracking. This financing gap will be worsened by the COVID 19 pandemics, which has adversely affected the tourism sector, one of the major



contributors to gross domestic product (GDP) and resulted in budget reallocation to the health sector (vaccines and protective clothing).

Assessment of the barriers and implications

The identified barriers which constitute challenges and gaps were assessed in terms of the severity and the risks they pose to achieving the ETF requirements. This assessment was based on results from the consultation with the stakeholders. Table 1 below depicts the barrier assessment results and implications for achieving the MRV/ETF requirements.

Nature of barrier	Significance of the barrier	Implications to achieving the transparency framework
Limited knowledge on the country's NDC and ETF	High Almost all the institutions interviewed are not familiar with the country's NDC and the MRV/ETF requirements	<ul style="list-style-type: none"> This will hinder the institutions to participate in the NDC tracking as they are not familiar with the NDC and ETF Institutions will not be able to provide the data and information on the mitigation measure as they are not familiar with the types of the data they are required to provide information on
Lack of institutional capacity	High Most of the institutions interviewed indicated that they have no skilled personnel to undertake the MRV or provide the necessary information for tracking the NDC in a transparent manner with clarity	<ul style="list-style-type: none"> The institutions will not be able to collect necessary and reliable data as they have no skilled personnel. Data will not be reliable and hence not fulfil the ETF requirements
Lack of data and gaps in the mitigation measures	High Most of the mitigation measures are implemented at the national scale at the household level. The database for these mitigation measures is poorly documented, particularly for solar geysers and boreholes Some of the mitigation measures are also subjected to vandalism, and thus, the numbers will vary significantly	<ul style="list-style-type: none"> Unreliable data and gaps will make it difficult to achieve the transparency framework
Weak institutional arrangement on data and information exchange	Medium The mitigation measures are spread across the various institutions, and there is a need for data and information exchange to track the NDC. Statistics Botswana is the central data agency task that produces and disseminates	<ul style="list-style-type: none"> Weak data and information exchange will hinder the tracking of the NDC and will result in data gaps for some of the mitigation, particularly solar geysers, solar boreholes and building retrofitting for



	official statistics. it has seconded its personnel to line ministers; however, the private sector is not covered	energy savings
Limited personnel on GHG inventory	High The MPG stresses the need for MRV/ETF to be consistent with the IPCC national GHG inventory. Currently, the country has limited personnel trained on the IPCC National GHG emissions inventory. Only three are trained on energy and mitigation measures GHG potential reduction	<ul style="list-style-type: none"> • This barrier will hinder the institutions' measurement of potential mitigation measures to reduce emissions because of a lack of knowledge of IPCC guidelines and procedures • Institutions will not be able to provide the necessary information to allow the GHG inventory team to track the NDC mitigation measures in a transparency manner with clarity
Absence of nationally approved tracking tools to track and report the mitigation	High Currently, there are no standardised tools available with the necessary information for the institutions to input the data	<ul style="list-style-type: none"> • Institutional capacity is limited and, therefore, will not be able to participate in the NDC Tracking and provision of the necessary information to meet the transparency framework • The data estimated by the GHG inventory team will be unreliable without the participation of the energy institutions
Low involvement and participation of the private sector	High Consultation with the stakeholders indicated that the private involvement in the NDC is low even though they are the implementers of most of the mitigation measures	<ul style="list-style-type: none"> • This will inhibit the flow of data from the private sector to the institutions and the GHG inventory team • Without the private sector participation, there is no guarantee of data reliability, and consequently, transparency compromised
Limited financial resources	High The Covid 19 pandemic will worsen the financing gap for the NDC implementation and develop systems and institutional arrangements for facilitating reporting in a transparent manner	<ul style="list-style-type: none"> • This will prevent the country from putting systems in place, train the personnel for reporting the NDC in a transparent manner

Table 1: An assessment of the barriers and implication in achieving the ETF.

Recommendations to close the gaps and remove the barriers

Based on the identified gaps and barriers, feasible recommendations were drawn in consultation with the stakeholders. The recommendations cover institutional arrangements, improved data collection and quality, enhanced private sector involvement and participation, and the development of the tracking tools. Fortunately, some of the recommended activities are at an advanced stage of development as they were outputs of the ICAT energy project for Botswana. These include the development of the tracking tools and proposed training on the tracking tools, which include the GHG inventory.

The recommended activities to remove the barriers (gaps and challenges) are discussed below.

Development of the stakeholder engagement strategy for NDC

The consultation with the stakeholders reveals weak and limited knowledge on the NDC and the MRV/ETF amongst the institutions. Consequently, weak and limited knowledge implies that consultation was done once or only a few members of the institutions were consulted. Therefore, it is important that stakeholder engagement in the NDC is maintained and sustained throughout its lifespan amongst the stakeholders. Furthermore, it is also critical that the stakeholder's involvement is clearly defined. This should be achieved by developing the stakeholder's engagement strategy (SES) for the NDC. SES is a strategy that sets out how the stakeholders will be engaged and involved in implementing the proposed project or programme. Instead of just consulting with the stakeholders, as is the current norm, strategic activities are devised to ensure stakeholders' involvement in the NDC tracking and reporting in a transparent manner. The development of the SES should be done in consultation with all the stakeholders, including the private sector, to ensure ownership of the document. Furthermore, the SES will greatly enhance the stakeholder's participation and involvement in the NDC, which is identified as one of the barriers.

Operationalisation of the SES

It is important that the SES is operationalised by implementing the identified strategic activities. Effective operationalisation of the SES will automatically imply that the stakeholders will be involved and are participating in the NDC implementation and the Paris Agreement Enhanced Transparency Framework. Areas of involvement and participation of the various groups, specifically data capture, data formatting and the necessary information, should be clearly defined in such workshops.

Development of the NDC tracking tools

One of the barriers to implementing the MRV/ETF Paris Agreement obligations is lack of tools to implement the NDC mitigation policies and measures. It is thus important that tracking tools are developed consistent with the National GHG inventory guidelines. This will greatly improve institutional capacity to track the NDC and provide the GHG national inventory team with the necessary information. It will also capacitate the private sector as presented by organisations such as Business Botswana and farmers' associations to collect the necessary information for tracking the NDC. As these tracking tools will be standardised and consistent with the IPCC guidelines, it will foster transparency and clarity in the tracking of the NDC across all sectors. Whilst this recommendation is made here, it is worth noting that the NDC tracking tools have already been drafted as one of the objectives and outputs of the ICAT energy sector for Botswana.

Training stakeholders on MRV/ETF and the IPCC guidelines

Stakeholders unanimously raised the need for training to enhance their capacity to collect the necessary information for NDC tracking. Training the stakeholders on the developed tracking tools will greatly improve the institutional capacity and enhance their knowledge of the NDC tracking and necessary information. Furthermore, it

will increase the number of personnel within the institutions, which is currently non-existence. Several training recommendations were made through consultations with the stakeholders. Some of the recommended training include:

- Training and capacity building on MRV requirements and setting up the MRV systems.
- Short awareness training on national GHG inventory emissions.
- High-level awareness training on IPCC methodology to estimate GHG emissions and removals.
- Training on the NDC Tracking tools, data analysis and interpretation.
- Training on data exchange platform operations.

Establishing a Memorandum of Agreement (MoA) and a Memorandum of Understanding (MoU) on data sharing

Statistics Botswana is the central statistics agency tasked with data collection and dissemination. It currently collects climate data used for the biennial update report (BUR) and the National communications. The private sector will be involved in implementing the NDC mitigation measures such as solar geysers, solar boreholes and building retrofitting. Consequently, the private sector will generate mitigation data essential for the NDC tracking. Therefore, it is critical that MoA and MoU are developed between the private sector, business communities, and Statistics and DMS to facilitate data and information exchange. MoA and MoU promote ownership and elucidate stakeholders' responsibilities regarding data and information. Therefore, developing MoA and MoU institutions will enhance stakeholders' ownership and responsibilities in the NDC's implementation and tracking. This will enhance and facilitate their full participation in terms of data provision, reporting the NDC mitigation, and support received.

Strengthening the legal framework for data and information sharing

Although the MoA and MoU are important for data and information, they are insufficient. It is thus critical that the existing legal instruments, particularly the Statistics Act of 2009, are enforced to ensure data sharing and information exchange. It is thus critical that it is enforced for other sectors, particularly the private sectors (suppliers of solar appliances such as solar geysers, solar pumps), to facilitate information exchange with Statistics Botswana. Sectors within the private sector that can be targeted for the NDC tracking include solar geysers, solar pumps, and LED lights suppliers. Furthermore, institutions such as BURS are vital information sources for mitigation measures. A combination of MoU/MoA and strengthening the legal framework on data sharing and information exchange will create an enabling environment that could facilitate data flow.

Establishing a data exchange platform

A data exchange platform is a system that allows institutions (public, private) to deposit the data for distribution, exchange and sharing electronically. As the name implies, it facilitates information flow and exchange amongst the stakeholders, which has been identified as a gap. Based on the developed tracking tools, it is recommended that a data exchange platform is established, which can be managed by the DMS in collaboration with Statistics Botswana. A combination of MoA/MoU strengthened legal framework, and the data exchange platform will enhance data and information exchange amongst the stakeholders.

Establishment of the incentives such as carbon trading to enhance private sector reporting

The private sector, particularly business communities, are profit driven and always aims to maximise profits. Providing incentivising for the private sector to provide reliable data and information for tracking the NDC mitigation will enhance the provision and flow of high-quality data from the private sector. Therefore, it is critical that incentives are established to facilitate data production and sharing. The feasible incentives that can be established include carbon emissions trading and tax incentives for reduced GHG emissions. Carbon emissions trading is a

market-based system that allows companies to trade their carbon emissions offsets. Companies must provide high-quality data on their emissions reduction, and the data must be verifiable (ICAP, 2020). Tax incentives can also be introduced to incentivise the companies to reduce their GHG emissions and provide information on the measures undertaken to reduce their emissions. Thus, introducing these incentives can influence the private sector to participate in the NDC tracking by providing and exchanging data and necessary information for NDC tracking.

In addition, the introduction of the carbon trading scheme can be a source of income for the private sector and could guide the successful implementation and tracking of the NDC mitigation measures.

Development of the financing strategy for the NDC implementation and tracking

A financing strategy is an organisation’s strategic document that outlines how an entity (organisation being private or public) plans to mobilise finance for its operations to meet targets. The critical elements of the financing strategy are financing gaps and the strategic options for financing. Currently, the GoB does not have an NDC financing strategy. Thus, the extent of the financing gap is not known. However, given the current financial situation, which has been worsened by Covid 19, the financing gap for the NDC will be high. It is thus important that a financing strategy that will be used for resource mobilisation is developed to raise revenue for the identified activities for NDC tracking.

Table 2 below summarises the barriers to implementing the Paris Agreement Enhanced Transparency Framework and the recommendations to remove the barriers.

Nature of barrier	Recommendation for enabling environment
Limited knowledge of the country’s NDC and ETF	<ul style="list-style-type: none"> • Develop the Stakeholder engagement strategy
Lack of institutional capacity	<ul style="list-style-type: none"> • Develop the tools and systems such as tracking tools • Train the institutions on IPCC guidelines for GHG emission inventory
Lack of data and gaps in mitigation measures	<ul style="list-style-type: none"> • Strengthen institutions to collect appropriate data • Set up systems for data collection • Introduce incentives to facilitate the collection and generation of high-quality data
Weak institutional arrangement on data and information exchange	<ul style="list-style-type: none"> • Establish MoA/MoU between institutions • Establish a data exchange platform • Strengthen and enforce the legal framework for information exchange
Limited personnel on GHG inventory	<ul style="list-style-type: none"> • Provide short course training and awareness training • Provide long terms training on GHG inventory
Absence of nationally approved tracking tools to track	<ul style="list-style-type: none"> • Develop the NDC tracking tools



and report the mitigation	
Low involvement and participation of the private sector	<ul style="list-style-type: none"> • Develop the stakeholder engagement strategy • Introduce the economic incentives such as carbon trading to incentivise the private sector
Limited financial resources	<ul style="list-style-type: none"> • Establish a stakeholder engagement strategy • Develop a financing strategy for the NDC

Table 2: Summary of recommended activities for enhancing the transparency framework

Conclusions

An assessment of the country’s institutional capacity, arrangements and legal framework concerning the MRV/ETF reveals a variety of barriers and gaps. The main barrier is the limited institutional knowledge of the NDC and the Paris Agreement Transparency Framework. Ultimately, this barrier will impede the institutions from participating in the NDC reporting. Subsequently, limited knowledge of the NDC and what is required from institutions will make it difficult for them to generate data for the mitigation and provide the necessary information for tracking transparently.

Another significant barrier is the limited institutional capacity to undertake the MRV/ETF. Almost all the institutions do not have the trained personnel on GHG emissions inventory and estimating the mitigation measures to reduce emissions. This is aggravated because the country does not have nationally developed and adopted NDC tracking tools. Furthermore, there are also budget constraints with undertaking the NDC tracking activities. These financial budget constraints will be exacerbated by the Covid 19 pandemic, which has affected the tourism sector, one of the largest contributors to the country’s GDP. Other barriers include low involvement and participation of the private sector and the communities in the NDC implementation, which could hinder information generation from these stakeholders. There is also a weak institutional arrangement of data and information exchange which is further compounded by the lack of a data exchange platform.

Thus, measures must be adopted to strengthen institutional capacity and arrangement for the NDC tracking. These measures may include training the institutions on NDC and the MRV/ETF, developing the NDC tracking tools, and developing a financial and stakeholder engagement strategy, and securing financial resources to implement all those measures



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