

**For Components 1 and 3 under the project
Nationally Appropriate Mitigation Actions
(NAMAs) for Low Carbon Island
Development Strategy for the Republic of
Mauritius
(NAMA Project)**

MRV Baseline Analysis

Prakash (Sanju) Deenapanray

ELIA – Ecological Living In Action Ltd

&

Federico A Canu

UNEP DTU Partnership

13 May 2021

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LIST OF ACRONYMS

AC	Adaptation Communication
BTR	Biennial Transparency Report
BUR	Biennial Update Report
CBIT	Capacity-building Initiative for Transparency
CC	Climate Change
CCD	Climate Change Division
CCM	Climate Change Mitigation
CEB	Central Electricity Board
CMA	Conference of Parties serving as Meeting of Parties to the Paris Agreement
CRT	Common Reporting Table
EEMO	Energy Efficiency Management Office
ETF	Enhanced Transparency Framework
FAREI	Food and Agricultural Research and Extension Institute
FMCP	Facilitative, Multilateral Consideration of Progress
FS	Forestry Services
GHG	Greenhouse Gas
GPG	Good Practice Guidance
GST	Global Stocktake
IPPC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
ITMO	Internationally Transferred Mitigation Outcomes
LULUCF	Land Use, Land Use Change and Forestry
MARENA	Mauritius Renewable Energy Agency
MCIA	Mauritius Cane Industry Authority
MESWMCC	Ministry of Environment, Solid Waste Management and Climate Change
MLTLR	Ministry of Land Transport and Light Rail
MNICD	Ministry of National Infrastructure and Community Development
MPG	Modalities, Procedures and Guidelines
MRV	Measurement, Reporting and Verification
MSIRI	Mauritius Sugarcane Industry Research Institute
NAMA	Nationally Appropriate Mitigation Action
NC	National Communications
NDC	Nationally Determined Contribution
NID	National Inventory Document
NIR	National Inventory Report
NLTA	National Land Transport Authority
PA	Paris Agreement
PMU	Project Management Unit
PSC	Project Steering Committee
QA/QC	Quality Assurance /Quality Control
TACCC	Transparency, Accuracy, Completeness, Consistency and Comparability
TER	Technical Expert Review
TNC	Third National Communication
TMRSU	Traffic Management and Road Safety Unit
TWG	Technical Working Group
UDP	UNEP DTU Partnership
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY

The baseline assessment has shown that institutional and human capacity strengthening is needed for enabling the Measurement, Reporting and Verification (MRV) of mitigation actions. At present, there is a general lack of strategic planning that focuses on climate change mitigation, and which would cover at least the 2030 time horizon. As a consequence, there is poor institutional infrastructure for data collection to track the implementation of mitigation actions. An exception is the energy industries wherein the CEB has a comprehensive institutional infrastructure for collecting and sharing data that can be used to track emission reductions. Even in this case, data collection is not used explicitly for developing mitigation scenarios.

The main barriers that impede the collection, generation and storage of data, indicators and emission factors needed for mitigation analyses have been identified as: lack of long-term mitigation strategies; lack of financial and human resources (in both public and private sector organizations); lack of technical capacity for data collection and determining Tier 2 or 3 emission factors; lack of technical guidance and quality assurance/quality control (QA/QC) procedures to validate the emission factors.

Apart from agriculture, energy industries and refrigeration and air conditioning, none of the emitting sectors has quality assurance & quality control plans and protocols for collected data. The baseline assessment has identified the following capacity enhancement requirements: institutional and human capacity strengthening through training on QA / QC procedures; setting up formal institutional arrangements and defining the roles of each institution in relation to data collection and quality assurance; and establishing an external quality assurance structure at the national level with clear relationships between internal and external data quality assurance.

The analysis has revealed that mitigation actions were not monitored across the board. Since medium-to-long-term planning is a weakness, prioritization of mitigation actions is not institutionalized. To date, no attempts have been made to quantify the indirect and direct effects, and sustainable development benefits of mitigation actions using a wide range of GHG and non-GHG indicators.

The profiled organizations do not have institutional capacity for identifying support needed in the form of financial assistance, capacity building and technology transfer. This observation is aligned with the fact that there is no strategic planning that focuses on climate change mitigation in the first place. Logically, there is no institutional capacity for reporting on support received.

1.0 INTRODUCTION

The Paris Agreement agreed by Parties to the UNFCCC defines the global objective to hold the increase in the global average temperature to well below 2°C above pre-industrial levels, and make efforts to keep warming below 1.5 2°C. The GHG emissions of Republic of Mauritius (RoM) are quite small fraction of global emissions but have been growing at a significant rate. In response to its obligations under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, Mauritius has submitted its Nationally Determined Contribution (NDC), outlining mitigation actions it intends to implement as a contribution to the achievement of the goals of the Paris Agreement, conditional on support from the international community.

As part of the climate relevant support received Mauritius is implementing the project “Nationally Appropriate Mitigation Actions for Low Carbon Island Development Strategy” through support of the Global Environment Facility. The project consists of the following three components with related outputs:

Component 1: Strengthen National Capability to identify, prioritise and develop mitigation actions to meet NDCs targets

- 1.1 Lead agency with convening power designated, and supported by a strong team involving key stakeholders established
- 1.2 A national voluntary emission reduction target formulated based on National reference GHG emission baseline established for each sector
- 1.3 A national NAMA list constituted and submitted to the “International Registry”
- 1.4 Partners for “Supported NAMAs” identified
- 1.5 Programmatic Sectoral NAMAs drafted
- 1.6 A National NAMA registry established
- 1.7 Approaches & methodologies for classifying and prioritizing NAMAs developed and implemented
- 1.8 Gender mainstreamed into this project and capacity building activities

Component 2: Initiate Implementation actions on renewable energy (RE) target to meet the NDC goals

- 2.1 Drafting of the Regulation on Electricity Tariff
- 2.2 Drafting of the Net Metering Rules and Regulation.
- 2.3 Development of an Excel and web-based tool for Tariff calculations (including operational manual) and capacity building for URA to use and update the tariff calculation tool.
- 2.4 Development of an online dashboard to monitor URA’s KPIs (including operational manual) and capacity building for URA to use and update KPI dashboard.
- 2.5 Co-funding of cost of CEB's cost of electricity services (supply) and thereof to set the fair price (tariff & rates and charges) for each electricity services.
- 2.6 Advanced metering infrastructure for smart meters.
- 2.7 Develop prioritized mitigation actions into financial project

Component 3: Establishment of an Enhanced Transparency Framework (ETF) to track and transparently report on NDC implementations

- 3.1 Institutional framework and organizational linkages for MRV, including link to in the national registry mechanism, established
- 3.2 MRV system, including monitoring plan covering key parameters for the electricity generation sector, designed & implemented
- 3.3 Local technical professionals to conduct MRV enabled
- 3.4 3.4 MRV technical committee specific to the energy pilot sector constituted

Component 3 responds to the establishment of the Enhanced Transparency Framework (ETF) under Article 13 of the Paris Agreement, enhancing capacities to adhere to the reporting requirements laid out in its Modalities, Procedures and Guidelines (MPG) on mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving NDC.

The ETF efforts would include a measurement, reporting and verification (MRV) system for NDC actions. This is central information to be reported through Biennial Transparency Reports which countries are requested to submit to the UNFCCC from 31 December 2024 the latest. Least Developed Countries and Small Island Development States can submit the reports at their discretion, but will still have to follow the requirement set out in the MPG upon submission.

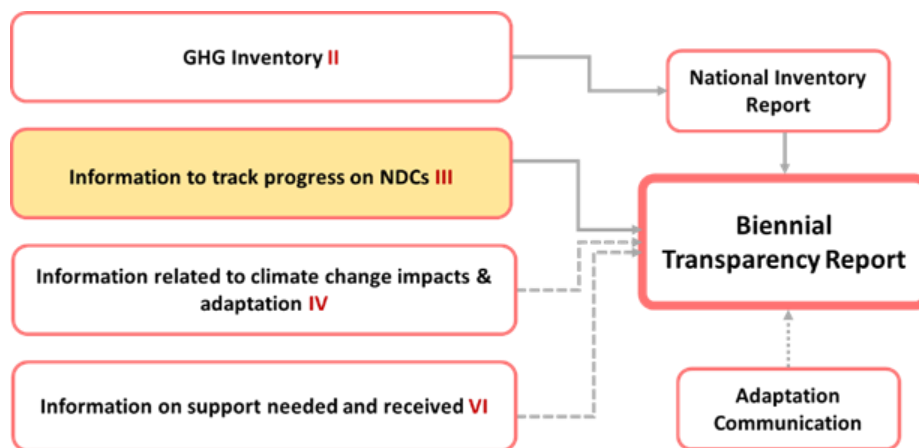


Figure 1. Illustration of typology of information to report through Biennial Update Reports.

Note: Dotted lines illustrate non-mandatory reporting aspects

Source: Own elaboration based on the Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement

The information to be reported includes information on institutional arrangements, NDC targets and indicators, specific actions conducive to the achievement of the NDC, emission projections and information on support needed and received. The development of an ETF, including MRV system, is therefore directly linked with the results of Outputs 1.1 to 1.3 under Component 1. Specifically the MRV system links the two components as follows: (1) in as much as there needs to be clear institutional responsibilities to coordinate development and implementation of NDCs (Output 1.1), institutions must also have a clear mandate to also monitor, evaluate and report the implementation of NDC mitigation actions. This is the objective of Output 3.1; (2) the mitigation actions comprising sectoral mitigation scenarios that will result from Output 1.2 will squarely dictate the parameters and

emission factors that will constitute the sector-specific MRV systems. This responds directly to the requirements of Output 3.2; and (3) the national registry for tracking the implementation of mitigation actions that will be developed under Output 1.3 will follow the architecture of the sector-specific MRV systems using the results of Outputs 3.1 and 3.2. Finally, the training proposed under Outputs 3.3 and 3.4 will follow directly from the results of Outputs 1.1 to 1.3 and Outputs 3.1 and 3.2. The clearly established linkages are the reason for carrying out activities proposed under Components 1 and 3 in parallel.

In order to better inform the design of the sector-specific MRV systems, a baseline study has been completed in order to assess the institutional capacities for implementing an ETF under Article 13 of the Paris Agreement. The baseline assessment also covers the following: (i) roles and responsibilities within institutions for managing climate change mitigation; (ii) whether or not sectoral climate change mitigation policies, strategies and action plans exist; (iii) the process for mitigation data collection and generation; and (iv) system of data quality assurance and quality control.

It is timely here to note that Component 3 of the NAMA project limits the development of an ETF and MRV system to the power sector. Since Component 1 covers mitigation actions from all emitting sectors, the scope of Component 3 has been extended to cover all mitigation (sub)-sectors for which emissions scenarios have been developed – i.e. energy (transport and energy industries), waste management, IPPU and agriculture, forestry and other land use.

The focus of the MRV baseline assessment is on the tracking of mitigation actions, non-GHG co-benefits and support needed and received. The report presents the methodological approach (Section 2) used to carry out the MRV baseline assessment. Section 3 analyses and discusses the results of the baseline survey. Conclusions are drawn in Section 4. The content of Section 3 will provide inputs to the structuring of the report on the institutional responsibilities for implementing mitigation actions.

2.0 METHODOLOGICAL APPROACH

The work plan proposed to use a multi-stakeholder approach to implementing project activities. Stakeholders are involved in the NAMA project through technical working groups (TWGs) and the project steering committee (PSC). The institutional mechanism used for the NAMA project is the same as that used for other national climate change related projects, such as the Third National Communication (TNC) and the Biennial Update Report (BUR). Project activities are implemented using sectoral TWGs as described in the Report on Institutional Arrangements for Climate Governance – Baseline analysis and recommendation.¹

A questionnaire has been developed for carrying out the MRV baseline assessment to be in line with the reporting requirements under the UNFCCC. It was developed based on the requirements of Article 13 of the Paris Agreement,² while, in part, drawing from the Capacity-building Initiative for

¹ PNK Deenapanray, 2020. Institutional Arrangements for Climate Governance – Baseline analysis and recommendations.

² UNFCCC, 2015. Decision 1/CP.21: Adoption of the Paris Agreement. Paris Climate Change Conference, Paris, France.

Transparency (CBIT) Country Self-assessment Questionnaire.³ The questionnaire shown in Annex 1 was designed with inputs from UDP serving as technical advisor to the NAMA project. The questionnaire passed through a validation step on its functionality through: (i) feedback from the Environment Statistic Unit at the Ministry of Environment, Solid Waste Management and Climate Change (MESWMCC), and (ii) beta testing by a selected sample of respondents from public and private institutions. The entire process was carried out over a period of four (4) months culminating in the dissemination of the final version to potential respondents in mid-August 2020. Project Management Unit (PMU) was responsible for coordinating the dissemination and application of the questionnaire by targeting key members of the TWGs, namely the chairpersons and deputy chairpersons of TWGs, and selected private companies that are involved in power generation. The PMU also liaised with the Ozone Unit at MESWMCC for collating information pertaining to the use and management of refrigerants.

The questionnaire was designed as an open source tool so that it could be used by any institution or organization as a capacity self-assessment tool. It is comprised of four sections and the vast majority of questions have customized pull-down menus for selecting answers. The four sections are:

- SECTION 1 - INSTITUTIONAL PROFILE
- SECTION 2 - POLICY -STRATEGY - ACTION PLAN
- SECTION 3 Part A - MITIGATION DATA COLLECTION & GENERATION
- SECTION 3 Part B - MITIGATION DATA QUALITY ASSURANCE & QUALITY CONTROL
- SECTION 3 Part C - IMPLEMENTATION OF MITIGATION ACTIONS
- SECTION 4 Part A - IDENTIFICATION OF SUPPORT NEEDED
- SECTION 4 Part B - REPORTING OF SUPPORT RECEIVED

3.0 RESULTS AND DISCUSSIONS

A total of twelve organizations have participated in the survey. The roles and responsibilities (or mandates) of these institutions are given in **Annex 2**. These organizations can be clustered around the Intergovernmental Panel on Climate Change (IPCC) GHG emitting sectors based on their roles and responsibilities (**Table 1**). This table also gives the sectoral share of national GHG emissions. Consequently, **Table 1** reveals that the MRV baseline assessment has a very high level of institutional coverage relative to sectoral GHG emissions.

Table 1. Grouping of participating organizations in IPCC GHG emissions sectors.

IPCC GHG emissions sector	% contribution to national GHG emissions/sinks ⁴	List of organizations who participated in the survey
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³ This questionnaire was used in the process of formulating the GEF-funded project entitled ‘Capacity-building Initiative for Transparency (CBIT)’. The tool was made available for the purpose of the NAMA project by the UDP.

⁴ Statistics Mauritius, 2020. Environment Statistics – 2019, Ministry of Finance and Economic Development, Mauritius.

Energy (energy industries)	42.4% (2,449.9 ktCO _{2e})	Central Electricity Board (CEB), Energy Efficiency Management Office (EEMO), and Mauritius Renewable Energy Agency (MARENA), Omnicane Ltd
Energy (manufacturing industries and construction, and others)	12.2% (706.9 ktCO _{2e})	CEB, EEMO
Energy (land transport)	19.6% (1,131.99 ktCO _{2e})	Ministry of Land Transport and Light Rail (MLTLR), Ministry of National Infrastructure and Community Development (MNICD, Mechanical Engineering Division), National Land Transport Authority (NLTA)
Agriculture	2% (116.37 ktCO _{2e})	Food and Agricultural Research and Extension Institute (Livestock and Food Crops); Mauritius Sugarcane Industry Research Institute (MSIRI) / Mauritius Cane Industry Authority (MCIA)
Forestry and Other Land Use (FOLU)	100% sink (360.9 ktCO _{2e}) ⁵	Forestry Services (FS)
Waste Management	23% (1,323.12 ktCO _{2e})	Solid Waste Management Division (SWMD), Ministry of Environment, Solid Waste Management and Climate Change (MESWMCC)
IPPU (refrigerant and air conditioning, RAC)	0.8% (48.77 ktCO _{2e}) ⁶	Ozone Unit, MESWMCC

Source: Authors' analysis

An analysis of the responses of the CBIT self-assessment questionnaire (see **Figure 2**) shows that Mauritius is still far from having all the prerequisites in place to allow for a robust response to the ETF requirements. Particularly the aspects of reporting on adaptation and support needed and received. These are only should requirements under the ETF, and are only correlated in some cases to reporting on mitigation actions, although still relevant. There are also large capacity gaps on NDC implementation reporting, directly correlated to mitigation action, while capacities are assessed to be strongest for GHG inventory reporting.

⁵ The SWMD has commented that the figures published by Statistics Mauritius were overestimated. According to calculations done in the context of the biennial update report (BUR), it is estimated that GHG emissions from the solid waste sector approximate 420 ktCO_{2e} (~21 Gg CH₄).

⁶ Discussions with the CCD, MESWMCC have revealed that emissions from refrigerants have been updated in the Biennial Update Report, and that an increase by a factor ~6 has been noted. The data reported in official statistics were derived from the TNC.

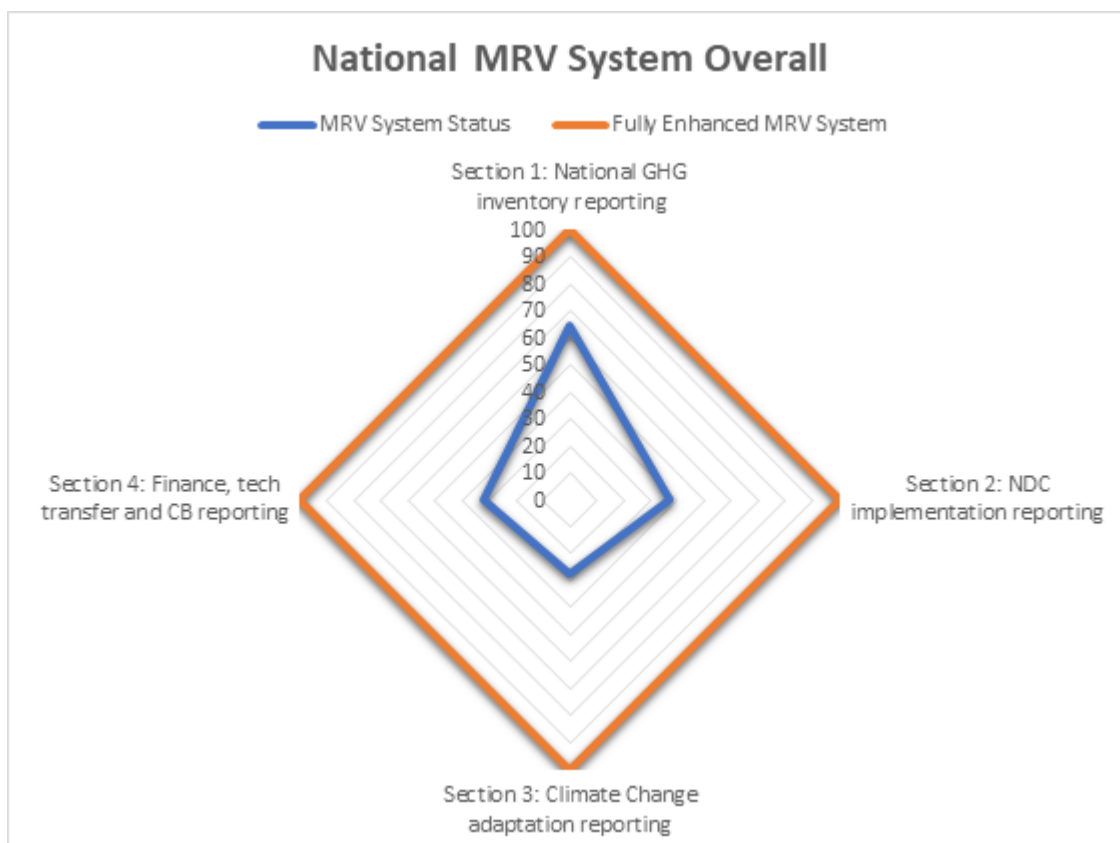


Figure 2. Overall analysis of the results of the CBIT self-assessment questionnaire.

Source: Own elaboration based on questionnaire responses

These overall observations are confirmed by the remaining analysis and discussions carried out following the four sections of the questionnaire elaborated for the purpose of this report.

3.1. Institutional Profile

Institutional profiling was carried out predominantly to assess the extent to which climate change, and, in particular climate change mitigation was formally institutionalized. The results are summarized in **Table 2**.

Table 2. Level of institutionalization of climate change mitigation.

Organization	Is there a formal position dealing with CC mitigation?	Is there a dedicated unit for CC?	Is there plan to set up a unit to work on CC?	Is it known yet which position in the organization will be the focal point / active user(s) of the online MRV Registry that the NAMA project will set up?
CEB	Yes (Environmental Affairs Officer)	No	Not known	Environmental Affairs Officer
EEMO	Yes	No	No	Senior Engineer, Energy Efficiency

Organization	Is there a formal position dealing with CC mitigation?	Is there a dedicated unit for CC?	Is there plan to set up a unit to work on CC?	Is it known yet which position in the organization will be the focal point / active user(s) of the online MRV Registry that the NAMA project will set up?
	(Acting Director)			
FAREI (Food Crop & Livestock)	Yes Food Crop – Principal Research Scientist Livestock - Senior Research Scientist	No – Food Crop No – Livestock	Not known Not known	Not yet known
FS	Yes (Assistant Conservator of Forests)	No	Not known	Assistant Conservator of Forests
SWMD	Yes (Principal Project Officer / Project Officer)	No	No	Principal Project Officer and Project Officer
MARENA	Yes (Officer in Charge)	No	Not known	Officer in Charge + Research & Development Officer + Information System Officer
MLTLR	No (Informally)	No	Not known	Technical staff of NLTA (Transport Planning Section) / Traffic Management and Road Safety Unit (TMRSU, Traffic Modelling Unit)
MNICD	No (Informally)	No	No	Not yet known
MSIRI-MCIA	Yes (Senior Technical Officer)	No	No	Research Officer of Plant Breeding Department
NLTA	Yes (Senior Transport Planning Officer)	Yes	N/A	Not yet known

Organization	Is there a formal position dealing with CC mitigation?	Is there a dedicated unit for CC?	Is there plan to set up a unit to work on CC?	Is it known yet which position in the organization will be the focal point / active user(s) of the online MRV Registry that the NAMA project will set up?
Omnican Ltd	Yes (Quality and Environment Coordinator)	Yes	N/A	Group Chief Sustainability Officer; Quality & Environment Coordinator; Property Development Sustainability Coordinator
National Ozone Unit, MESWMCC	Yes (Head of Ozone Unit)	Yes (CCD, MESWMCC)	N/A	Not yet known

Source: Authors' analysis

The results shown in **Table 2** reveal the following:

- All organizations profiled deal with climate change mitigation (CCM) through either a formal organizational structure or informally. It appears that line Ministries are those that deal with CCM in an informal way with the exception of MESWMCC that has a dedicated Climate Change Division (CCD);
- Close to 60% of the profiled organizations did not have a dedicated unit working on CCM (and other climate change related issues), and there was either no plan to create such a unit or the information was not available as to whether there was such a plan;
- Whereas the MLTLR does not have CCM institutionalized, the NLTA acting as its technical arm does have the function institutionalized;
- An observation can be made that there is a general tendency for organization with a technical vocation to have the CCM function institutionalized; and
- Regardless of the level of institutionalization of the CCM function, most profiled organizations have clearly identified staff that will interact with the proposed MRV Registry. Although FAREI, NLTA and the National Ozone Unit have not yet identified staff for this purpose, it is noteworthy that they all have formal institutional positions that deal with CCM. It is, therefore, quite likely that these formal positions will also be the ones to interact with the proposed MRV Registry.

3.2. Policy, Strategy and Action plan

The requirement for a MRV system is premised on the foundation that mitigation actions have been or are being developed, and for which implementation will require monitoring and evaluation (M&E) in terms of quantities of GHG emission reductions, as well as sustainable development co-benefits or alternatively non-GHG benefits. Therefore, the MRV baseline analysis has been availed of to assess the presence of sectoral policies, strategies and action plans that relate directly to low-carbon development or that can be used to define mitigation actions. The survey has also analyzed the following issues, namely: (i) gender mainstreaming in sectoral policies and strategies; (ii) the time

horizon covered by these documents; (iii) where they exist, whether or not policies and strategies are accompanied by an M&E framework; and (iv) institutional capacity for carrying out mitigation scenario analyses. The results of the analysis are summarized in **Table 3**.

Table 3. Analysis of sectoral policies, strategies and action plans related to CCM.

Organization	What type(s) of strategic documents exist(s)? P – Policy; S – Strategy; AP – Action Plan	Is Gender mainstreamed?	Is there an M&E framework?	Level of human and institutional capacity for carrying out mitigation scenario analysis
CEB	S (the Ministry of Energy and Public Utilities that is the parent Ministry of CEB has developed a Renewable Energy Roadmap 2030 for the Electricity Sector ⁷ ; this document can be used to develop mitigation scenarios; there is also a 10 year roadmap for the integration of electric vehicles ⁸)	No	No	Not answered
EEMO	AP	No	No (the Masterplan proposes the creation of an EE Observatory that will be tasked with collecting data on EE indicators)	None
FAREI (Food Crop & Livestock)	S – AP (covers both mitigation and adaptation; Strategy covered the period 2016 – 2020, and	No	No	None

⁷ Republic of Mauritius, 2019. *Renewable Energy Roadmap 2030 for the Electricity Sector*, Ministry of Energy and Public Utilities, Port Louis; At the time of finalizing the MRV Baseline Analysis, the Renewable Energy Roadmap 2030 was being updated.

⁸ EVConsult and Ecosys Ltd, 2020. *A 10 Year Electric Vehicle Integration Roadmap for Mauritius*.

Organization	What type(s) of strategic documents exist(s)? P – Policy; S – Strategy; AP – Action Plan	Is Gender mainstreamed?	Is there an M&E framework?	Level of human and institutional capacity for carrying out mitigation scenario analysis
	it is in the process of being updated; the new time horizon is yet to be decided			
FS	None	No	No	None
SWMD	S (A Strategic Plan has been developed through Phase 1 of a Consultancy study funded by AfD. Phase 2 of the Consultancy study is focusing on a feasibility study of composting plants and sorting units for the North and West of Mauritius and will be completed by April 2021; the SWMD has proposed four technological options for solid waste management between 2020 and 2030 that can be used to develop mitigation scenarios ⁹)	No	No	None
MARENA	S (there is a Renewable Energy Strategic Plan 2018-2023 ¹⁰ and the RE Roadmap 2030 (being updated) that can be used to develop mitigation scenarios)	Yes	No	None
MLTLR	S	Not answered	Not answered	Not answered

⁹ Presentation made by Mr B. Beerachee, Ag. Director, SWMD on 17 December 2020 as part of the national dialogue on the formulation of the National Environment Policy.

¹⁰ https://www.marena.org/resp-2018-23#h.p_ASNXuTsWAIJd – accessed 15 January 2021.

Organization	What type(s) of strategic documents exist(s)? P – Policy; S – Strategy; AP – Action Plan	Is Gender mainstreamed?	Is there an M&E framework?	Level of human and institutional capacity for carrying out mitigation scenario analysis
	(No information is available on the Strategy)			
MNICD	None	No	No	None
MSIRI-MCIA	P - AP (No information is available on the Policy and Action Plan)	No	No	None
NLTA	P (no information is available on the Policy; the NAMA project has worked with the NLTA to identify mitigation actions in the land transport sub-sector)	No	No	None
Omnican Ltd	No (Omnican Ltd has strategic documents that can be used to develop mitigation scenarios)	Not answered	Not known (Omnican Ltd has a comprehensive tool for carrying out carbon accounting)	Not answered
National Ozone Unit	P – S – AP (e.g. Policy and Strategy related to domestication of commitments taken by Mauritius under the Vienna Convention and the Montreal Protocol; HCFC Phase Out Management Plan 2011 – 2025; HFC Management Plan under preparation)	No	No	None

Source: Authors' analysis

It is clear from **Table 3** that, except for the supply side in the electricity (covering inputs from CEB and MARENA) and IPPU sectors, none of the sectors have official low-carbon strategies or strategic plans that can be used to develop mitigation scenarios. In the case of demand side management, there is an Energy Efficiency Masterplan that covers the period 2016-2030 and it is accompanied by an Action Plan with year-on-year total energy savings. However, the energy savings cannot be attributed to individual mitigation actions. The EEMO has used the Masterplan to develop an AP covering the period 2017-2022 but the actions cannot be translated into GHG emission reductions.

In the case of solid waste management, data are available and technological options have been proposed by the SWMD for developing mitigation scenarios to 2030. The timing of 2029/2030 proposed for thermal WtE by SWMD is based on the following project implementation plan: 1) **Feasibility phase** incl. characterisation studies, feasibility studies and conceptual/detailed designs (2-3 years), 2) **Project preparation phase** including setting-up of institutional and regulatory frameworks, preparation of bidding documents (1-2 years) and 3) **project implementation phase** including evaluation of bids, contract negotiations, pre-conditions (EIA) and construction and commissioning (4-5 years). The timing is not compatible with the proposed timeline for WtE in the Renewable Energy Roadmap 2030.¹¹ As regards the amount of energy that can be generated from waste, this is dependent on the quantity and quality of wastes to be incinerated and these will eventually depend on the implementation of other projects (composting plants, sorting units and biogas plants) planned between 2020-2030.

Also, it is not clear whether the electricity demand used in the Renewable Energy Roadmap 2030 includes the integration of electric vehicles or that it includes energy efficiency gains resulting from the application of the EEMO action plan. The CCM nexus between electricity generation, electrification of land transport and solid waste management is an area that deserves more attention, and is a good example of the need for strong institutional coordination to develop coherent cross-sectoral low-carbon development strategies.

There are interventions proposed in the Strategic Plan 2016-2020 for the Non-Sugar Sector¹² that could be carried forward and developed as mitigation actions. Although the strategic plan detailed an implementation plan of projects that cover the period 2016 – 2020, and that it is currently under review, the broad strategies related to climate change adaptation and mitigation will span over a longer time period, well beyond 2030.

It is timely here to make reference to mitigation actions that have been proposed in the NDC of Mauritius.¹³ The mitigation actions related to the energy industries were aligned with the prevailing government energy strategy and action plan.¹⁴ The same applied to the non-sugar agriculture.¹⁵ For the other sectors, a bottom-up approach was used to identify mitigation contributions. As discussed below, the mitigation actions underlying these contributions have not been formalized in sectoral

¹¹ The Renewable Energy Roadmap 2030 is being updated, and initial feedback is that that there will be likely be no WtE project before 2030.

¹² Ministry of Agro-Industry and Food Security, 2016. *Strategic Plan 2016-2020 for the Non-Sugar Sector*. MAIFS, Port Louis.

¹³ Republic of Mauritius, 2015. *Nationally Determined Contribution for the Republic of Mauritius*, Republic of Mauritius, Port Louis.

¹⁴ Republic of Mauritius, 2009. *Long-Term Energy Strategy 2009-2025*. Ministry of Renewable Energy and Public Utilities, Port Louis.

¹⁵ Ministry of Agro-Industry and Food Security, 2016.

strategies and action plans. These observations are in line with the CBIT self-assessment questionnaire responses related to NDC implementation (see **Figure 3**), showing that the institutional arrangements for NDC implementation and reporting are fairly delineated. However, there are large gaps in the monitoring of NDC implementation and data collection and management.

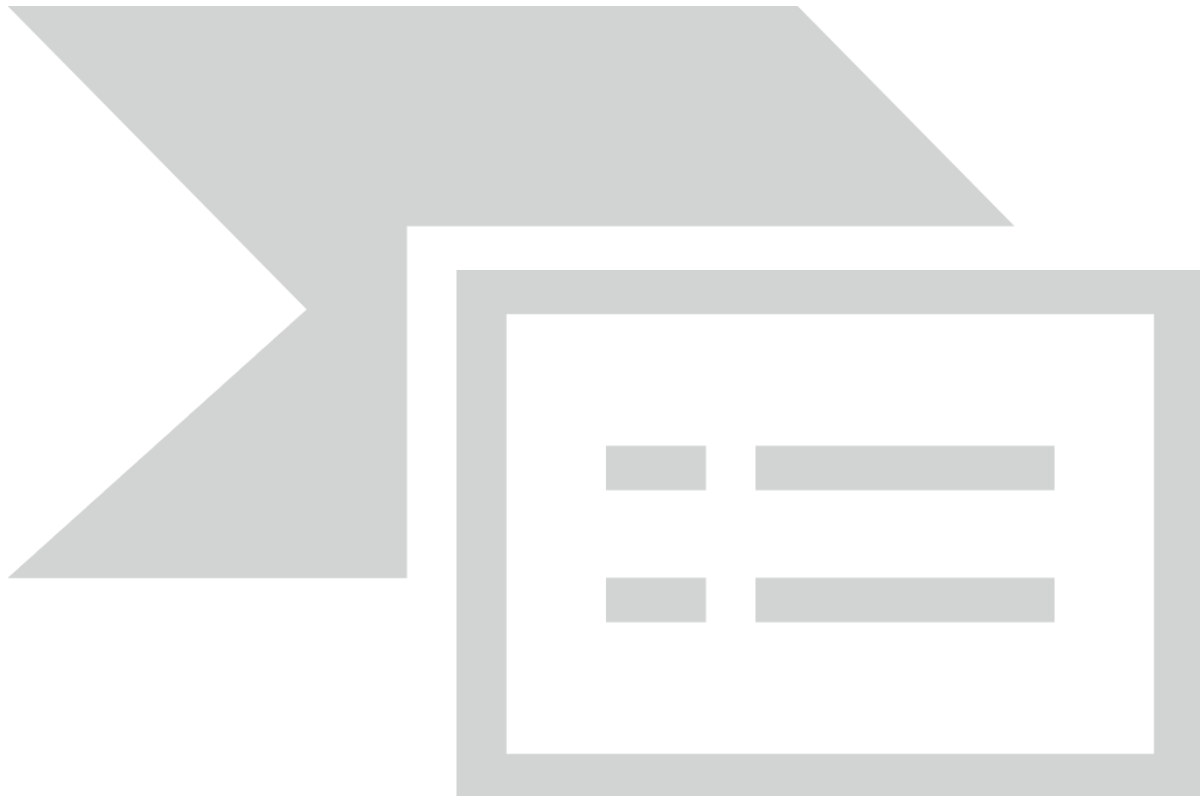


Figure 3. Results of the CBIT self-assessment questionnaire on NDC implementation reporting.
Source: Own elaboration based on questionnaire responses

Where policies, strategies and action plans exist, the time horizon does not exceed 2030. Based on scientific evidence, carbon neutrality must be reached at the planetary level as early as 2050, and national dialogues conducted in the context of developing an Environment Master Plan for Mauritius have proposed to establish a national target for carbon neutrality by 2070. In this context, it will be imperative for public institutions to develop policies and strategies beyond 2030 to ensure that short- and medium-term actions (before 2030) are compatible with the long-term objective of carbon neutrality.

The analysis also shows that there are low human and institutional capacities for carrying out gender mainstreaming and for developing mitigation scenarios. Also, there is a need to reinforce the practice of developing M&E frameworks for tracking the implementation of strategies and action plans. Technical assistance and training provided under the NAMA project on the requirements of the ETF of the Paris Agreement; the formulation of clear institutional roles for the development and implementation of mitigation actions; and the design and operationalization of a MRV Registry will support organizations to enhance their M&E capabilities.

3.3. Mitigation Data

The MRV baseline analysis also covered the extent to which institutional capacity and mechanism exist for generating data for carrying out mitigation scenario analyses, and for MRV purposes. It also assesses the quality assurance and quality control (QA-QC) system that is in place within profiled organizations. Finally, an assessment is done to cross-check the extent to which mitigation scenarios have been developed first, and then translated into sectoral policies, strategies and action plans. This is assessed because there could be instances wherein mitigation scenarios may be developed using a bottom-up approach in the absence of sectoral policies and strategies – as could be most probably the case based on the discussions given in section 4.2. Once developed, there is then an opportunity for the mitigation scenarios to be translated into budgeted mitigation action plans.

3.3.1. Mitigation Data Generation & Collection

Instead of carrying out the analysis of the survey questions by organization, it is more useful to do it by emission sector. Another point to note in favour of this approach is that data collection is usually carried out by the technical arms of line ministries that are foremost responsible for developing policies and strategies. The results are summarized in **Table 4**, and they are drawn from the institutional grouping given in **Table 1**. It is pointed out that the CEB, FAREI, FS, National Ozone Unit, NLTA and SWMD are technical organs, and that the results shown in **Table 4** reflect predominantly their profiling.

The results show that mitigation scenarios have been developed for all the mitigation sectors, but, except for the energy industries, these scenarios have not been translated into budgeted mitigation actions as part of sectoral strategies. The mitigation scenarios were accompanied by sectoral MRV systems defining the parameters, including emission factors that needed to be collected. The CEB provides the only example among profiled organizations that has a comprehensive data management system, as well as formal arrangements for institutional data sharing. In most cases, the collection of data for carrying out and tracking mitigation scenarios is not an institutional requirement, and it is carried out on a voluntary basis. For the Livestock agricultural sub-sector and solid waste management, data collection is at 40% and 60%, respectively.

Table 4. Data availability at sectoral level.

IPCC GHG emissions sector	Main observations
Common issues	
Agriculture, Energy (land transport), FOLU, Solid Waste Management	<ul style="list-style-type: none"> - <u>Mitigation scenarios were developed in the TNC</u> using the IPCC 2006 methodologies. Officers were trained to use the IPCC software for generating inventories of GHGs. - <u>Scenarios were not translated into budgeted action plans</u> in strategic documents - There is <u>no data management structure</u> for measuring and no formal institutional agreements for the sharing of parameters/indicators required for developing and tracking mitigation scenarios - <u>MRV systems</u> identifying parameters and emission factors needed to develop and track mitigation scenarios were <u>developed in the TNC</u>. However, the <u>MRV systems were not operationalized</u> and served only for the purpose of reporting under the TNC. - There is <u>no institutional mechanism for sharing sectoral data</u>, indicators and emission factors for national reporting processes and obligations. Nevertheless,

IPCC GHG emissions sector	Main observations
	for GHG emissions reporting purposes primary and secondary data are submitted to the Ministry of Environment.
Sector specific issues	
Agriculture	<ul style="list-style-type: none"> - There is a <u>lack of standardized templates for collecting these data</u>. Data are currently captured in spread sheets - For Livestock sub-sector, about 40% of parameters needed for tracking mitigation scenarios are measured - There is generally <u>no institutional requirements for data collection</u>, and any such data collection is done on a voluntary basis - All mitigation scenarios have used <u>Tier 1 emission factors</u>. The need for Tier 2 or Tier 3 emission factors have been identified: for Food Crop analyses, there is a need to determine nitrous oxide emission from managed soil, while emission factors from enteric fermentation would be needed for Livestock analyses - The <u>main barriers</u> that impede the generation and collection of data are: (1) Food Crop - Lack of adequate human resources, limited financial resources, low priority considerations (main focus on food security and increase food production), and absence of long term mitigation strategies; (2) Livestock – lack of human and institutional capacity among participating private sector organizations
Energy (energy industries)	<ul style="list-style-type: none"> - Various types of mitigation scenario modeling have been carried out in this sub-sector, including MAED, Mauritius Pathways Calculator, TNC and the NDC - The RE Roadmap to 2030 has an implicit time bound emission reduction target - There is a comprehensive data management structure for the collection and storage of data, including data confidentiality and privacy - Data for mitigation analyses are complete and are compiled using spread sheet templates, verified and kept as confidential. Data shared with Statistics Mauritius to be published in energy digest - Data collection and sharing is done through MOU mainly with independent power producers and Statistics Mauritius - Data used to develop annual grid emission factor (Tier 2), and there is a need to develop Tier 3 emission factors for fuels used in electricity generation - The main barriers are: (i) lack of facilities to carry out analyses of fuel samples; and (ii) lack of technical guidance and QA/QC procedures to validate the emission factors
Energy (land transport)	<ul style="list-style-type: none"> - <u>There is a strategy for data management</u>, including regular updates, backup, and archive routines - There are <u>no templates for recording data</u> and data collection is done on a <u>voluntary basis</u> in spread sheets - Tier 1 emission factors were used to carry out mitigation scenario analysis in alignment with national inventories, and the main barrier has been identified as lack of Tier 3 emission factors
Forestry and Other Land Use (FOLU)	<ul style="list-style-type: none"> - There is <u>no data management structure</u> for measuring and storing parameters needed to develop and track mitigation scenarios - There are <u>templates for collecting these data</u>, and <u>data collection is done on a voluntary basis</u> - There is <u>no institutional requirement for data collection and storage</u> - All mitigation scenarios have used <u>Tier 1 emission factors</u>. The <u>need for Tier 2 or Tier 3 emission factor</u> has been identified as: (i) country-specific data to calculate

IPCC GHG emissions sector	Main observations
	<p>the above-ground biomass growth, from country specific net annual increment of growing stock (will require collection of specific data such as dbh, height, wood density etc); and (ii) Increment and wood removal</p> <ul style="list-style-type: none"> - The <u>main barriers</u> that impede the generation and collection of data are: (i) lack of human resources; (ii) lack of training/capacity in field of data collection and analysis; and (iii) inadequate resources for data collection, storage and analysis
Waste Management (solid)	<ul style="list-style-type: none"> - There is <u>no data management structure</u> for measuring parameters needed to develop and track mitigation scenarios. There is a recording system at the transfer stations and the landfill whereby the amount of wastes (mixed) is recorded using weighbridge software. - There is no need for data sharing across institutions since all data are generated within the organization boundary - There is a <u>lack of standardized templates for collecting these data</u>. Data are currently captured in spread sheets - <u>About 60% of parameters needed for tracking mitigation scenarios are measured</u>, and collection is still required for the following data: Total GHG emission from landfill, GHG emission from waste transportation, GHG emission at the transfer stations - There are <u>no institutional requirements for data collection</u> - All mitigation scenarios have used <u>Tier 1 and 2 emission factors</u>. The need for Tier 2 or Tier 3 emission factor has been identified as Methane Generation Rate Constant - The <u>main barriers</u> that impede the generation and collection of data are lack of financial resources and technical capacity
IPPU	<ul style="list-style-type: none"> - There is a <u>data management structure</u> for measuring parameters needed to develop inventories, and this is done using a web-based system. No mitigation scenarios have been developed to date because as shown in Table 1; - Although data on product uses are carried out by third parties, the response from the National Ozone Unit is that there is no need for data collection from the end-users.¹⁶ However, the barriers listed below would seem to indicate that there is a need for data collection on the net consumption of refrigerants; - There is a <u>lack of standardized templates for collecting these data</u>; - <u>About 40% of parameters needed for tracking mitigation scenarios are measured</u> but hampered by barriers detailed below; - There are <u>no formal institutional mechanisms for data collection</u> - <u>Tier 1 emission factors</u> are used in GHG National Inventories; - The <u>main barriers</u> that impede the generation and collection of data are: (1) lack of a structured mechanism in place on the measure the consumption, importation and exportation of refrigerants; and (2) lack of an online portal or web-based system for the application, processing and storage of data at local level.

Source: Authors' analysis

¹⁶ This could be due to the fact that data on the use of refrigerants can be obtained from the Customs Services as all such products are imported and regulated by the National Ozone Unit.

The main barriers that impede the collection, generation and storage of data, indicators and emission factors needed for mitigation analyses are: lack of long-term mitigation strategies; lack of financial and human resources (in both public and private sector organizations); lack of technical capacity for data collection and determining Tier 2 or 3 emission factors; lack of technical guidance and QA/QC procedures to validate the emission factors; lack of institutional mechanism for data collection; and inadequate resources for data collection, storage and analysis.

3.3.2. Mitigation Data Quality Assurance (QA) & Quality Control (QC)

The sectoral approach described in the previous section has been used to assess the institutional capacities for mitigation data QA / QC. The lack of technical guidance and capacity on the application of QA / QC procedures was identified as a barrier in the previous section. The National Ozone Unit is the only example that has reported a complete data QA / QC system. The National Ozone Unit applies the IPCC 2006 guidelines and the relevant QA / QC system to carry out inventory of refrigerants. CEB also has a clear QA / QC plan outlining the activities that need to be carried out for data collection. It also has a plan for the continuous improvement of data, indicators and emission factors. It is timely to note here that CEB already has the capacity for calculating the standardized grid emission factor for the electricity system of Mauritius. However, it still has shortcomings related to applying the principles of transparency, uncertainty and completeness. This is the same in all mitigation sectors.

The following additional observations can be made:

- None of the emitting sectors other than agriculture, energy industries and IPPU has QA / QC plans and protocols for collected data. In the case of agriculture, QC is carried out at the parent institution, while QA is carried out by consultants recruited by the Ministry of Environment to work on national communications and biennial update reports;
- Mitigation analyses and scenarios are not reviewed by an independent external institution or by independent experts. Hence, there is no opportunity for an independent verification of data quality;
- The support needed have been identified as: institutional and human capacity strengthening through training on QA / QC procedures; setting up formal institutional arrangements and defining the roles of each institution in relation to data collection and quality assurance; and establishing an external quality assurance structure at the national level with clear relationships between internal and external data quality assurance.

3.3.3. Implementation of Mitigation Actions

The MRV baseline analysis sought to assess the extent to which mitigation actions were implemented and monitored through the following set of questions:

- Is there any mechanism to monitor individual mitigation actions within your sector? For instance, by tracking the data, indicators and emission factors used in mitigation analyses;
- Has a prioritization of mitigation actions been conducted in your sector/organization?
- Have methods for quantification of direct and indirect effects of mitigation actions been established?
- Have metrics to capture non-GHG co-benefits (e.g. health, job creation) been developed?

The questionnaire survey revealed that mitigation actions were not monitored across the board. Since medium-to-long-term planning is a weakness (except for the power sector) as discussed earlier,

prioritization of mitigation actions is not institutionalized.¹⁷ To date, no attempts have been made to quantify the indirect and direct effects, and sustainable development benefits of mitigation actions using a wide range of GHG and non-GHG indicators.

3.4. Support Needed and Received

Under the United Nations Framework Convention on Climate Change (UNFCCC), developing countries typically receive support in different forms, including financial, technology development and transfer and capacity building.

The CBIT self-assessment questionnaire identified high capacity gaps on reporting on support (see **Figure 4**). While the institutional arrangements for reporting seem to be fairly well delineated, challenges remain high for reporting on support needed, and especially on support received.



Figure 4. Results of the CBIT self-assessment questionnaire on reporting on support needed and received.

Source: Own elaboration based on questionnaire responses

The ETF established under Article 13 of the Paris Agreement, and its MPG requests developing countries to report on support needed and received in these areas as a “should” requirement, meaning that reporting on this information is not mandatory. Nevertheless, centralizing and reporting such information is important in order to create an overview in order to assess the support received

¹⁷ Prioritization of mitigation actions have been carried out under the TNA project and in the TNC using a programmatic approach, but the methodologies have not been institutionalized to date to inform the sectoral planning process.

by developing countries in relation to the expected 100 billion a year agreed to be provided by developed countries to developing countries. In addition, a prior step before receiving support is to first identify climate change related support needed.¹⁸ Consequently, the MRV baseline analysis contains an assessment of institutional / sectoral capacities for identifying support needed and for reporting on support received.

3.4.1. Identification of Support Needed

The result of surveys has shown that none of the sectors have formal methodologies and procedures for identifying climate change related support needed. As a consequence, templates for collecting data on support needed, and QA / QC systems to check the veracity of these data are not in place. In order to avoid these weaknesses, profiled organizations have identified the establishment of standard operating procedures for data collection and reporting in relation with support needed as a priority. This should be accompanied by an adequate data management system that includes QA / QC. The National Ozone Unit is the only organization reporting having a strategy for the management of information on support needed.

3.4.2. Reporting on Support Received

A direct consequence of the shortcoming discussed in section 4.4.1 is that profiled organizations do not have the institutional and human capacity for reporting on support received. It is not without surprise that the operationalization of standard operating procedures for the monitoring and assessment of support received has been identified to address this weakness.

4.0 CONCLUSIONS

A baseline assessment has been carried out using a questionnaire survey to analyze the institutional and human capacities for carrying out the MRV of mitigation actions that would be required under Article 13 of the Paris Agreement. A total of thirteen (13) public and private organizations have been surveyed covering the main GHG emitting sectors of Mauritius.

The main conclusion is that there are very low institutional and human capacities for carrying out MRV of mitigation actions. This stems from the fact that, except for the energy industries, none of the sectors carry strategic planning that would cover the time horizon to at least 2030. In the absence of prioritization of mitigation actions at the sectoral level, resulting in the absence of mitigation action plans, there is poor institutional infrastructure for data collection to track the implementation of mitigation actions. An exception is the energy industries wherein the CEB has a comprehensive institutional infrastructure for collecting and sharing data that can be used to track emission reductions. The CEB is also the only organization profiled that has the capacity to develop Tier 2 emission factor – i.e. the grid emission factor for the national electricity system. In this specific case and in the case of solid waste management, IPPU and the Livestock agriculture sub-sector where data are partially collected, there is a need to establish an adequate QA / QC system to check the quality and veracity of data collected. None of the other organizations had an adequate data management system for collecting and storing information, and there were no institutional arrangements for data sharing.

¹⁸ Ideally countries should have a climate rationale to justify their climate change support requested – i.e. not development assistance in general, but the climate component of a given intervention.

The MRV baseline assessment has revealed that, even in the general absence of strategic planning, institutions have previously developed mitigation scenarios (except for the IPPU sector that had previously reported relatively small emissions). These scenarios were accompanied by sectoral MRV systems that identified the parameters and emission factors that would be needed to monitor the implementation of the actions underpinning the mitigation scenarios. However, these low-carbon scenarios were not integrated into formal strategic and action plans, and hence no monitoring of the mitigation actions was carried out.

The profiled organizations do not have institutional capacity for identifying support needed in the form of financial assistance, capacity building and technology transfer. This observation is aligned with the fact that there is no strategic planning that focuses on climate change mitigation in the first place. Logically, there is no institutional capacity for reporting on support received.

ANNEX 1 – QUESTIONNAIRE

Dear Colleague,

Greetings.

A national project aiming to develop sectoral low-carbon strategies is being implemented by the Ministry of Environment, Solid Waste Management and Climate Change. A fundamental aspect of ensuring climate change mitigation - i.e. reducing and/or offsetting atmospheric greenhouse gases - rests on accountability and transparency. This implies the management of greenhouse gas emissions through a system of Measurement, Reporting and Verification (MRV). The MRV system can be seen as a part of a sector's or organization's Monitoring and Evaluation (M&E) system. Any M&E system would form part of a broader planning and implementation process.

A baseline assessment is being carried out across sectors and organizations in order to establish the current state of affairs regarding the management of climate change mitigation. *Please note that you can also use the questionnaire as a self-assessment tool.* In order to improve efficiency amidst the ongoing Covid-19 pandemic, a questionnaire has been customized to obtain feedback from respondents.

In order to facilitate the time needed to answer the questions, most answers can be given using customized pull-down menus. The legend given in the area highlighted in **YELLOW** provides further guidance.

There are four sections to the completed. These are:

SECTION 1 - INSTITUTIONAL PROFILE

SECTION 2 - POLICY -STRATEGY - ACTION PLAN

SECTION 3 Part A - MITIGATION DATA COLLECTION & GENERATION

SECTION 3 Part B - MITIGATION DATA QUALITY ASSURANCE & QUALITY CONTROL

SECTION 3 Part C - IMPLEMENTATION OF MITIGATION ACTIONS

SECTION 4 Part A - IDENTIFICATION OF SUPPORT NEEDED

SECTION 4 Part B - REPORTING OF SUPPORT RECEIVED

Please note that all answers will be treated anonymously, and that the synthetic results of the baseline analysis will neither refer to any particular organization nor to its answers.

Your participation and collaboration is kindly acknowledged.

Thank you.

On behalf of the national NAMA project

Questionnaire developed by
Sanju Deenapanray
ELIA - Ecological Living In Action Ltd

v1 - 14 May 2020

v2 - 31 July 2020 (beta-tested)

v3 - 11 August 2020 (final version)

[Section 4 draws from the CBIT Country Self-
assessment Questionnaire]

SECTION 1 - INSTITUTIONAL PROFILE

1. What kind of institution do you work for?
- 2.a. Please give the name of your organization?
- 2.b. Please provide a brief description of your organization (e.g. mandate; activities etc...)
- 2.c. How many persons are employed by your organization?
- 2.d. What is the proportion of total employees who are Female?
- 2.e. What is the average annual budget or turnover of your organization?
- 3.a. What is your position in the organization?
- 3.b. What is your gender?
4. For how long have you been in the current organization?
- 5.a. Do you deal with issues related to 'climate change (CC)'?
- 5.b. If answer to '5.a.' is 'Yes' please specify in which capacity?
- 5.c. If answer to '5.a.' is 'Yes', which aspects of CC do you cover?
- 5.d. If answer to '5.a.' is 'No', is there a position that deals with 'climate change'?
- 6.a. Is there a unit in your organization that is responsible for 'climate change'?
- 6.b. If answer to '6.a.' is 'Yes', which aspects of CC does it cover?
- 6.c. If answer to '6.a.' is 'Yes', how many persons does the unit host?
- 6.d. If answer to '6.a.' is 'Yes', what fraction of unit employees are Female
- 6.e. If answer to '6.a.' is 'No', is there a plan to set up a unit to work on CC?
7. The NAMA project will set up a national MRV portal. Which position(s)/function(s) in your organisation will be the focal point/active users of the online MRV system?

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- N/A if answer to '5.a' is 'No'

- N/A if answer to '5.a' is 'No'

- N/A if answer to '6.a' is 'No'

- N/A if answer to '6.a' is 'No'

- N/A if answer to '6.a' is 'No'

SECTION 2 - POLICY - STRATEGY - ACTION PLAN

1. Does your organization have a Policy (P), Strategy (S) and/or Action Plan (AP) on CC?

2. If answer to '1' is 'No', does your organization envisage to develop a CC Policy, Strategy and/or Action Plan?
3. If answer to '1' is other than 'No', which aspects of CC are covered?
4. If answer to '1' is 'No', does your organization have a **P, S and/or AP** that does not specifically address CC but that can be translated into climate actions (i.e. low-carbon development; increasing climate resilience)
5. If answer to '1' is other than 'No', is the P, S and/or AP accompanied by a Monitoring & Evaluation Framework?
- 6.a. If answers to '1' is other than 'No' OR '4' is 'Yes', is the P,S and/or AP gender-differentiated?
- 6.b. If answer to '6.a' is 'Yes', please specify the gender orientation.
- 6.c. If answer to '6.c' is 'Do not know', please indicate reason.
7. Does your organization have the human and institutional capacity to carry out mitigation scenario analyses?

- N/A if there are no Policy, Strategy and Action Plan on CC
- N/A if there are no Policy, Strategy and Action Plan
- N/A if there are no Policy, Strategy and Action Plan
- N/A if there are no Policy, Strategy and Action Plan
- N/A if there are no Policy, Strategy and Action Plan

SECTION 3 Part A - MITIGATION DATA COLLECTION & GENERATION

- 1.a. Have mitigation scenarios been developed in your sector previously?
- 1.b. If answer to '1.a' is 'Yes', please specify. If answer is 'Other', please give details at C68.
- 1.c. If answer to '1.a' is 'Yes', which modeling approach was used?
- 1.d. If answer to '1.c' is 'Other', please specify simulation technique and tools used.
- 1.e. If answer to '1.a' is 'Yes', have these scenarios been used to establish targets for time-bound reductions of GHGs in your sector?
2. If answer to '1.a' is 'Yes', was a template for data and emission factors developed?
3. Are the key datasets or indicators required for mitigation analysis identified?

- N/A if there are no mitigation scenarios
- N/A if there are no mitigation scenarios

4. Do templates or guidelines for data collection at sectoral level exist?
- 5.a. How complete is the collection of data identified for mitigation analysis?
- 5.b. If dataset is incomplete, please provide a list of data that need to be collected.
6. Is data collection for carrying out mitigation analysis done on a voluntary basis?
7. In your sector, which Tier emission factors are used in mitigation analyses?
8. Is there a need for data collection or emission factors from different sectors?
9. If answer to '8' is 'Yes', are there any formal agreements in place for obtaining data & emission factors from other sectors/institutions?
10. If answer to '9' is 'Yes', what is the form of the formal agreements for collaboration in data collection?
11. How are the data and indicators for mitigation analyses collected and stored?
12. Does a strategy for data management exist, including regular updates, backup, and archive routines?
13. Do policies for data handling exist, for example regarding data confidentiality and privacy?
- 14.a. Is there an institutional mechanism for sharing sectoral data, indicators and emission factors for national reporting processes and obligations?
- 14.b. If answer to '14.a' is 'Yes', please describe the existing institutional mechanism, and suggestions on how its effectiveness and efficiency can be enhanced.
15. Which Tier 2 or Tier 3 emission factors do you think should be generated in your sector?

- N/A if there are no mitigation scenarios

- N/A if there are no formal agreements

16. What are the main barriers that impede the collection, generation and storage of data, indicators and emission factors needed for mitigation analyses in your sector? Please list in descending order.

SECTION 3 Part B - MITIGATION DATA QUALITY ASSURANCE (QA) & QUALITY CONTROL (QC)

1.a. Do the methods of data collection follow established IPCC guidelines and protocols?

- N/A if no data is collected whatsoever

1.b. If answer to '1.a' contains 'Other', please indicate methods and protocols used.

2. Does a quality assurance and quality control plan exist, outlining the activities to be done and the responsibilities for doing them?

3. Are quality control and assurance procedures documented through checklists or other means?

4. Are quality control and assurance procedures done at the sectoral level.

5. Does a plan for continuous improvement of the inventory of data, indicators and emission factors exists?

6. Are the mitigation analyses and scenarios reviewed by an independent external institutions or by independent experts?

7. Regarding the principle of transparency, are any existing mitigation scenarios explicit in their methodologies, data, emission factors and assumptions?

- N/A if there are no mitigation scenarios

8. Regarding the principle of accuracy, is the analysis of uncertainty included in any existing mitigation scenarios?

- N/A if there are no mitigation analyses

9. Regarding the principle of completeness, which gases do mitigation analyses include?

- N/A if there are no mitigation analyses

10. What kind of support is required for setting up (if none exists) or improving (if one exists) a/the QA and QC system in your sector?

SECTION 3 Part C - IMPLEMENTATION OF MITIGATION ACTIONS

1. Are any mitigation scenarios translated into policies that can be budgeted?
2. Is there any mechanism for monitor individual mitigation actions within your sector? For instance, by tracking the data, indicators and emission factors used in mitigation analyses.
3. Are quality control and quality assurance procedures for monitoring different mitigation actions applied?
4. Has a prioritization of mitigation actions been conducted in your sector/organization?
5. Have methods for quantification of direct and indirect effects of mitigation actions been established?
6. Have metrics to capture non-GHG co-benefits (e.g. health, job creation) been developed?

- N/A if there are no mitigation scenarios developed in the sector yet
- N/A if there are no mitigation actions identified in the sector yet
- N/A if there are no mitigation actions/scenarios identified/developed in sector yet

SECTION 4 Part A - IDENTIFICATION OF SUPPORT NEEDED (finance, capacity building, technology transfer)

1. Are the procedures for identification of support needed established?
2. Are templates used for data collection and reporting?
3. Are quality assurance and quality control procedures for the reporting of support needed applied?
4. Are data from different stakeholders collected regularly?
5. Does an information system for management of information on support needed exist?
6. Does a strategy for management of information on support needed, including backup and archive routines, exist?
- 7.a. Is there a need for optimization of procedures to report support needed?
- 7.b. If answer to '7.a' is 'Yes', please detail enhancements needed.

SECTION 4 Part B - REPORTING OF SUPPORT RECEIVED (finance, capacity building, technology transfer)

1. Are the procedures for identification of support received established?
2. Are templates for collection and reporting of information about support received applied?
3. Are quality assurance and quality control procedures for reporting of support received applied?
4. Are data from different stakeholders collected regularly?
5. Does an information system for management of information on support received exist?
6. Does a strategy for management of information on support received, including backup and archive routines, exist?
- 7.a. Is there a need for optimization of procedures to report support received?
- 7.b. If answer to '7.a' is 'Yes', please detail enhancements needed.

ANNEX 2 – ROLES AND MANDATES OF PARTICIPATING INSTITUTIONS

Name of Institution	Role / Mandate
Central Electricity Board (CEB)	Generation, Transmission, Distribution and Sale of Electricity
Energy Efficiency Management Office (EEMO)	<p>The EEMO was established in 2011 under the Energy Efficiency Act to promote the efficient use of energy; promote national awareness for the efficient use of energy as a means to reduce carbon emissions; and protect the environment. The EEMO operates as a department of the Ministry of Energy and Public Utilities. The three main areas of activity of the EEMO are, mandatory energy efficiency labelling of electrical appliances in Mauritius; mandatory energy audits by large energy consumers and implementation of the recommendations thereof; and awareness raising on energy efficiency and energy conservation.</p>
Food and Agricultural Research and Extension Institute (FAREI)	<p>The Institute conducts research in non-sugar crops, livestock and forestry, and provides an extension service to farmers in Mauritius including its outer islands. It has as objectives to:</p> <ul style="list-style-type: none"> • Introduce, develop and promote novel technologies in the food and non-sugar agricultural sector within a sustainable framework; • Co-ordinate, promote, and harmonise priority research activities in the non-sugar agricultural, food production and forestry; • Promote and encourage agricultural and agri-business development through the setting up of agricultural youth clubs, agricultural women clubs and agricultural entrepreneur clubs; and • Promote dissemination and practical application of research results.
Forestry Services	<p>The Forestry Service, under the aegis of the Ministry of Agro Industry and Food Security, is responsible for the management of the State Forest Lands in Mauritius. The overall mandate, roles and responsibilities of the Forestry Service are defined primarily in the Forest and Reserves Act of 1983 and the Forestry Policy of 2006.</p>

	<p>The Vision Statement of the Forestry Service is: “To ensure a healthy forest environment that will satisfy the needs and aspirations of present and future generations for goods and services derived from our forests in a sustainable manner”.</p> <p>The Mission Statement of the Forestry Service is: “To sustainably manage our forest resources for, with and on behalf of the people of Mauritius”.</p> <p>The main activities of the Forestry Service include:</p> <ul style="list-style-type: none"> i. Enforcement of Forest laws (Forests and Reserves Act and Shooting and Fishing Leases Act) ii. Production, sale and issue of Plants iii. Reforestation/Afforestation and Maintenance of Forest plantations. iv. Exploitation of Forest Produce. v. Shooting and Fishing Leases (Deer Ranching) vi. Creation and Maintenance of Firebreaks in Forest vii. Conservation of Biological Diversity viii. Recreational Forestry (nature walks) ix. Education, Awareness and Research work in the field of forestry x. Processing of request from Government Institutions, private sector and public (clearances and permits)
<p>Mauritius Renewable Energy Agency (MARENA)</p>	<p>The Agency is responsible to promote renewable energy and create an environment conducive to the development of renewable energy.</p> <p>MARENA has a function to 'compile and analyse data on use and benefits of RE.</p>

	Please see also https://www.marena.org/about/about-marena
Mauritius Cane Industry Authority (MCIA)	<p>The mission of the MCIA is to promote the development of the cane sector and its clusters through systematic policy measures, creating an enabling environment with innovative and efficient services, research and development, technology transfer and value addition to meet current and future challenges. The MSIRI, operating under the aegis of the MCIA, conducts research on canes to enhance the cost effectiveness and competitiveness of the cane industry.</p> <p>The MCIA has the following mandate:</p> <ul style="list-style-type: none"> • <i>Responsible to promote and support sustainable development, efficiency and viability of the cane industry</i> • <i>Formulate and implement policies, strategies, plans, programmes and schemes for the cane industry</i> • <i>Provide services such as research, regulation of cane milling, sugar storage, mechanical land operations, advice on adoption of modern and efficient agricultural practices by producers.</i>
Ministry of Land Transport and Light Rail (MLTLR)	Mandate is to plan and put in place strategies to enhance mobility of people and goods through a safe, modern, green and reliable transport system. The aim is to implement a well-articulated transport system that seamlessly integrates inter-modal transportation. This would be achieved through the modernisation of our transport network and with intelligent transport planning tools to also reduce congestion and number of road fatalities.
Ministry of National Infrastructure and Community Development (Mechanical Engineering Division) (MNICD)	Maintenance/Repairs/Servicing to the Government Fleet Vehicles/Plants; Consultancy Services in Automobile and Building Mechanical Engineering Services
National Land Transport Authority (NLTA)	<p>1. Registration and transfer of ownership of motor vehicles;</p> <ul style="list-style-type: none"> • Licensing of public service vehicles and goods vehicles as well as petrol service stations; • Collection of road tax and other license fees; • Controlling and monitoring the examination of motor vehicles;

	<ul style="list-style-type: none"> • Keeping statistics relating to motor vehicles; and • Enforcement of road transport legislation and monitoring the level of service of public transport; <p>2. Planning of new transport services.</p>
Omnicane Limited	<p>Omnicane Limited, incorporated in 1926, is a public company quoted on the Official List and the Sustainability Index of the Stock Exchange of Mauritius. Its issued share capital is held 70.25% by Omnicane Holdings Ltd (OMHL), 10.08% by the National Pensions Fund and 19.67% by some 2,140 individuals and companies.</p> <p>With 1,396 people employed, Omnicane is involved in the cultivation of sugarcane, and the production of refined sugar, bioethanol, and energy in Mauritius. Property development is also becoming a major development pillar for the Group in line with the vision of the Government of Mauritius to promote smart cities around the island. The Mon Trésor smart city has been officially launched in June 2015 and the company will ensure that this development complies with the principles of sustainability, more specifically in line with the requirements of the BREEAM Communities framework.</p> <p>In addition, Omnicane’s strategy is to export its cane-cluster model to Africa and to seize new opportunities in the renewable energy sector in the region.</p>
Solid Waste Management Division (SWMD), MESWMCC	Responsible for solid waste management across the island
National Ozone Unit, MESWMCC	The National Ozone Unit has been established to implement the commitment taken by Mauritius under the Vienna Convention and the Montreal Protocol, and its amendments namely the Kigali Amendment on HFC. It implements plans to phase out ozone depleting substances, ODS (RMP (1999), TPMP (2006), HPMP 2011-2025). It provides clearances to importers on imports of HFCs/HCFCs/ODS refrigerants (a quota system will be worked out for implementation as from 2024 that is the freeze year under the Kigali Amendment). It carries out and submits a yearly data reporting on imports of refrigerants/ODS. It advises on the promotion of natural alternatives (ammonia, carbon dioxide, hydrocarbons) in the refrigeration and air conditioning sub-sector, undertakes awareness/sensitisation activities, and prepares policies (economic to shift technologies), strategies and action plan (prep. HFC Management Plan under process). It coordinates capacity building for technicians/trainers/custom officers. It also provides inputs under the relevant laws (Dangerous

	<p>Chemical Control Act, Consumer Protection (Control and Supplies) Act, Customs tariff Act) for the domestication of relevant obligations under the Protocol and its instrument. It coordinates with UNEP, GIZ, Ozone and Multilateral Fund Secretariat as well as other IGOs to implement the Protocol.</p>
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Annex 3 - REPORTING REQUIREMENTS UNDER THE UNFCCC,

With the Paris Agreement (PA) and its Article 13, the ETF for action and support was established. The modalities, procedures and guidelines (MPG) for Article 13 provide operational details on how to report on the information on national GHG inventories, tracking of progress of implementation and achievement of NDCs, climate change impacts and adaptation efforts, support provided and received for implementing the PA, and general functioning of the ETF.

All countries that have ratified the PA will continue submitting National Communications (NC) every four years, and will have to start submitting Biennial Transparency Reports (BTR)¹⁹ by 31 December 2024 the latest. Least Developed Countries and Small Island Developing States have the possibility to submit BTRs at their discretion. The MPG are also designed with built-in flexibility, which takes into account Parties' different capacities, by differentiating between « shall » (mandatory), and « should » and « encouraged » (not mandatory requirements).

Countries may choose to submit the NC and the BTR in a single report in the years they coincide, following the requirements set out in the MPGs and for the additional information required by the NC guidelines.²⁰ All countries are required to submit a National Inventory Report (NIR) in conjunction with their BTR, either as a part of the BTR or a separate report. Countries can also submit an Adaptation Communication (AC) as part of their BTR.

The BTR will undergo a Technical Expert Review²¹ (TER) process of maximum one year, followed by the Facilitative, Multilateral Consideration of Progress (FMCP). If the TER is not available within 12 months of the submission of the Party's BTR, the secretariat will make arrangements for the Party to participate in a FMCP at the next available opportunity. **Figure 5** shows that the process for reporting and review, both pre 2024 and post 2024, takes place in parallel to the process of NDC submission (every five years, starting from 2020), and to the process of the Global Stocktake (GST) (every five years, starting from 2023). Parties are also invited to communicate mid-century, long-term low greenhouse gas emission development strategies called long-term strategies (LTS), by 2020²².

¹⁹ The existing framework with Biennial Update Reports will be discontinued, although countries can choose to submit their latest BUR in conjunction with their first BTR following the requirements set out by the MPGs.

²⁰ However, for the purpose of NC, Parties shall include additional chapters on research and systematic observation and on education, training and public awareness, in accordance to the relevant guidelines contained in, as applicable, decisions 4/CP.5 and 17/CP.8. Furthermore, if a Party decides not to report on information related to climate change impacts and adaptation in the BTR, the merged reporting shall also include an additional chapter on adaptation, in accordance to the relevant guidelines contained in, as applicable, decisions 4/CP.5 and 17/CP.8 as applicable.

²¹ The Technical Expert Review can be conducted in different ways, namely as a centralised, in-country, desk-based or simplified review.

²² By COP decision 1/CP.21, paragraph 35 [2].

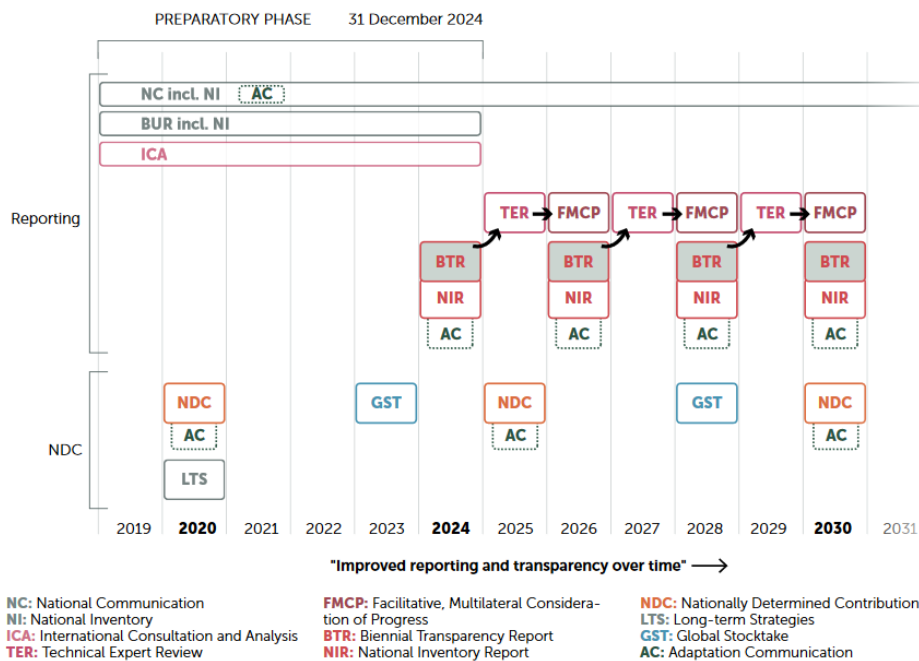


Figure 5. Potential timeline and frequency for reporting and review before and after the entry into force of the ETF.

Source: Dal Maso, M., & Canu, F.A. 2019. *Unfolding the reporting requirements for Developing Countries under the Paris Agreement’s Enhanced Transparency Framework.*

Due to the project’s focus on the MRV of mitigation actions, the following presents only a selection of relevant reporting requirements, and for the most part does not present the full set of reporting requirements for GHG inventories, adaptation and support needed and received, even though these aspects are also covered by the MPG. The presented information will only focus on these aspects where information is relevant for mitigation actions.

A3.1. Relevant Requirements for National GHG Inventory Reports

The NIR consists of a national inventory document (NID) and the common reporting tables (CRT) containing the inventory of national anthropogenic GHG emissions and removals prepared in accordance with the IPCC guidelines. The structure of the NID and the CRT are currently being negotiated under the UNFCCC with a decision mandated for COP26 in 2020, but now postponed to 2021 due the Covid-19 pandemic. NIRs can be submitted either as a component of the BTR or as a stand-alone report, and shall be submitted on the online portal maintained by the UNFCCC Secretariat.

For developing countries, the main changes to be highlighted comparing current requirements for NIRs are that:

1. The “should” requirement for NIR submission under the Convention has become a “shall” under the Paris Agreement’s ETF, and is therefore mandatory.
2. The NIR shall, under the Paris Agreement’s ETF, follow the IPCC guiding principles (Transparency, Accuracy, Completeness, Consistency and Comparability, TACCC), which will also guide the technical expert review of the reported information.
3. Under the ETF, there is a mandatory provision for all countries, to use the 2006 IPCC Guidelines, as well as any subsequent version or refinement to be agreed upon by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA).

Under the ETF, countries have to implement and maintain national GHG inventory arrangements, including institutional, legal and procedural arrangements for the continued estimation, compilation and timely reporting of national inventory reports. Under the ETF countries shall report on functions related to inventory planning, preparation and management, such as:

- National entity or national focal point responsible for the national inventory;
- Inventory preparation process, including division of specific responsibilities of institutions participating in the inventory preparation
- Archiving of all information for the reported time series, including all disaggregated emission factors and activity data, all documentation about generating and aggregating data, including quality assurance/quality control (QA/QC), review results and planned inventory improvements;
- Processes for the official consideration and approval of the inventory.

This is relevant in terms of aligning the institutional arrangements for NIR with institutional arrangements for tracking and reporting on NDC progress and achievement, including mitigation actions to achieve the NDC.

The IPCC 2006 Guidelines basically keep the same methodological approach of the 1996 guidelines, integrating the 2000 Good Practice Guidance (GPG) and the 2003 IPCC GPG for Land Use, Land Use Change and Forestry (LULUCF), and updating emission factors and parameters to be used in the estimation of GHG emissions and removals. These emission factors and their update with any subsequent version or refinement the CMA might agree upon using, are important to consider, as they might relate to the emission factors used to monitor emission reductions from mitigation actions.

A3.2. Requirements on Information to Track Progress on Nationally Determined Contributions

The MPGs provide guidance on the relevant information to be reported to describe the NDC, track the progress of its implementation, and assess its achievement. The reporting requirements in terms of information can be divided into the following:

- National circumstances and institutional arrangements ;
- Description of a Party's NDC under Article 4 of the Paris Agreement, including updates;
- Information necessary to track progress made in implementing and achieving its NDC under Article 4 of the Paris Agreement;
- Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement;
- Summary of GHG emissions and removals;
- Projections of greenhouse gas emissions and removals, as applicable; and
- Other information.

Information on national circumstances and institutional arrangements includes a description of the government structure, population profile, geographical profile, economic profile, climate profile, and sector details. In addition, countries shall report on sustainable development and poverty eradication

aspects in their NDC, if applicable²³. Although this information is not part of the mandatory requirements for BTRs, it might be included if the country has already placed it in its NDC.

Countries are also requested to provide information on the institutional arrangements in place to track progress made in implementing and achieving its NDC, as listed in **Table 5**. Future changes in institutional arrangements shall be reported in the BTR, and unchanged information can be provided as a reference to previous reports.

Table 5. Information to be provided in BTR on national circumstances and institutional arrangements.

Information to be reported	BTR requirements ²⁴
National Circumstances, and how they affect GHG emissions and removals over time	Government structure
	Population profile
	Geographical profile
	Economic profile
	Climate profile
	Sector details
Institutional arrangements for domestic implementation, monitoring, reporting, archiving of information and stakeholder engagement related to the implementation and achievement of the NDC	Legal arrangements
	Institutional arrangements
	Administrative arrangements
	Procedural arrangements
	Arrangements for tracking Internationally transferrable mitigation outcomes (ITMO)
	Changes in institutional arrangements

Source: Dal Maso, M., & Canu, F.A. 2019. *Unfolding the reporting requirements for Developing Countries under the Paris Agreement’s Enhanced Transparency Framework*.

The MPGs provide guidance on the relevant information to be reported to describe the NDC, as shown in **Table 6**.

²³ [Decision 4/CMA.1](#) Further guidance in relation to the mitigation section of decision 1/CP.21 [3] [3]

²⁴ [Decision 18/CMA.1](#) Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement [4]

Table 6. Information to be provided in BTR on description of NDC and similar information to be provided in the NDC.

BTR requirements	NDC requirements ²⁵
Target and description, including target type	General description of the target
	Target relative to the reference indicator, expressed numerically (e.g. in % or amount)
Target year(s) or period(s), and whether they are single-year or multi-year target(s)	Whether it is a single-year or multi-year target, as applicable
Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s)	Reference year(s), base year(s), reference period(s) or other starting point(s)
Time frame(s) and/or periods for implementation	Time frame and/or period for implementation, including start and end date
Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases	Sectors, gases, categories and pools covered by the NDC
	Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans
Intention to use cooperative approaches that involve the use of ITMOs towards NDC	The intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable
Any updates or clarifications of previously reported information	Information on the circumstances under which the Party may update the values of the reference indicators

Source: Dal Maso, M., & Canu, F.A. 2019. *Unfolding the reporting requirements for Developing Countries under the Paris Agreement's Enhanced Transparency Framework.*

A3.3. Targets and Indicators

Countries shall report on progress and achievement of their NDC. Different types of targets and indicators can be used, on the basis of the NDC types. **Table 7** gives an overview on the types of targets and indicators included in submitted NDCs. In addition, the table provides a brief description of the target types and gives examples of what information and indicators are relevant to report, when reporting this information in the BTR. Mauritius' NDC target falls within the Emissions reductions below a projected baseline (e.g. BAU) target, with an additional list of mitigation activities provided (strategies, plans and actions).

²⁵ Information to facilitate clarity, transparency and understanding of NDC, required starting from the second NDC submission, and strongly encouraged for the first NDC submission, including when communicating or updating it by 2020. Described in Annex I of Decision 4/CMA.1 Further guidance in relation to the mitigation section of decision 1/CP.21

Table 7. BTR requirements related to the choice of targets and indicators to keep track progress in implementing and achieving NDC.

Target	Indicator(s) to track NDC progress (examples provided in the MPGs)	Target description	Target tracking
Absolute emissions reduction ²⁶	Net GHG emissions and removals	<ul style="list-style-type: none"> • Target year(s) or period(s), and whether they are single-year or multi-year target(s) • Time frame(s) and/or periods for implementation • Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases • Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s) 	<ul style="list-style-type: none"> • Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s) • Most recent information on each indicator and on the construction of the baseline • For quantitative targets, the relation between reference, target and most recent information (e.g. percentage)
Emissions intensity reduction ²⁷	Percentage reduction of GHG emissions per unit of GDP		
Emissions reductions below a projected baseline (e.g. BAU ²⁸)	Net GHG emissions and removals		
Strategies, plans and actions ²⁹	Relevant qualitative indicators		
Mitigation co-benefits of adaptation actions or economic diversification plans, policies and measures ³⁰	Net GHG emissions and removals		
	Quantitative and qualitative mitigation indicators (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)		

Source: Dal Maso, M., & Canu, F.A. 2019. *Unfolding the reporting requirements for Developing Countries under the Paris Agreement's Enhanced Transparency Framework.*

A3.4. Information to Track Progress on NDC Implementation and Achievement

For tracking progress on NDC implementation and achievement, countries will be required to provide the information for each selected indicator in the BTR for the reference points³¹, update the

²⁶ National GHG emissions target for a future year (2025/2030) expressed in relation to a base year/period (1990/2005)

²⁷ The target is expressed as national GHG intensity (GHG emissions per unit of GDP or per person, etc.).

²⁸ Projected national GHG emissions (2025/2030), expressed with respect to projected GHG emissions in that year (2025/2030) if no actions additional to those already being implemented are taken to limit GHG emissions.

²⁹ Targets are expressed as specific strategy, policy and mitigation actions. Thus, the target is to adopt and implement these policies and actions, and do not have to have a specific GHG emission reduction goal.

³⁰ Economic diversification plan in the context of climate change refers to two concepts: (1) Strategies aimed at increasing economic resilience by shifting away from vulnerable products, markets, and jobs, towards low-emission and climate resilient income sources; and (2) measures aimed at reducing the adverse impacts of the implementation of climate change mitigation policies that have cross-border effects. This is especially relevant for countries which economies are concentrated on a few products/services/sectors, and those which products/services/sectors they rely on are expected to experience a drop in consumption as a result of mitigation measures in other countries.

³¹ I.e. Reference point(s), level(s), baseline(s), base year(s) or starting point(s)

information if any recalculation of the GHG inventory provides new revised values, and compare the reference values with the most recent information for each indicator at the time of reporting. For example, Mauritius has provided a target as a percentage of GHG emission reduction (30%) compared to a BAU (7 Mt CO₂e), and it should therefore report on the current value of emission reduction in percentage or tCO₂e at the time of reporting.

For BTRs that will provide information on the end year or end of the period of its NDC, countries will also have to provide an assessment of whether they have achieved the target set out in their NDC, 2030 in the case of Mauritius.

All the information requested (see **Table 8**) shall be provided in a structured summary, including contribution from the LULUCF sector for each year of the target period or target year, if not included in the inventory time series of total net GHG emissions and removals. The format of the structured summary will be narrative and/or tabular, according to the outcomes of the current negotiations, for which a decision is mandated for COP26 and expected in 2021.

As part of this summary, countries participating in cooperative approaches that involve Internationally Transferred Mitigation Outcomes (ITMOs) are also required to provide their annual emissions by sources and removals by sinks covered by the NDC, an emissions balance reflecting the level of emissions adding transferred ITMOs, and/or subtracting ITMOs used/acquired. Matters related to Article 6 of the PA and the use of ITMOs are still under negotiations, and further guidance on Article 6 on cooperative approaches will be provided by the UNFCCC and might define additional information to be provided in the BTR.

Table 8. Information to be provided in BTR on tracking progress of NDC implementation and achievement.

Information to report	BTR requirements
Indicator(s) to track NDC progress	Describe, for each indicator how it is related to the target
	Provide the information/value for each indicator for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), and update the information with any recalculation of the GHG inventory
	Provide the most recent information for each indicator for each reporting year during the implementation period of the NDC
	Compare the most recent information for each selected indicator to track progress made in implementing the NDC
Describe each methodology and/or accounting approach used for target(s), the construction of baselines and each indicator identified	Key parameters, assumptions, definitions, data sources and models used
	IPCC guidelines used
	Metrics used
	Any sector, category or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance

	Methodologies used to estimate mitigation co-benefits of adaptation actions and/or economic diversification plans
	Methodologies associated with any cooperative approaches that involve the use of ITMOs
	Methodologies used to track progress arising from the implementation of policies and measures
	Any other methodologies related to the NDC, and conditions and assumptions relevant to the achievement of the NDCs
	How the methodology in each reporting year is consistent with the methodology or methodologies used when communicating the NDC
	Methodological inconsistencies with the Party's most recent NIR, if applicable
	How double counting of net GHG emission reductions has been avoided

Source: Dal Maso, M., & Canu, F.A. 2019. *Unfolding the reporting requirements for Developing Countries under the Paris Agreement's Enhanced Transparency Framework*.

A3.5. Mitigation Policies and Measures, Actions and Plans

Countries are requested to provide information on actions, policies and measures that support the implementation and achievement of the NDC. These policies, measures, actions and plans also include adaptation actions and economic diversification plans with mitigation co-benefits. The reporting of information on policies, measures, actions and plans should be organised by sector (energy, transport, industrial processes and product use, agriculture, LULUCF, waste management or other).

In future BTRs, countries should identify actions, policies and measures that are no longer in place compared to previous BTRs, and explain the reason why. Actions, policies and measures that affect GHG emissions from international transport should also be identified. Countries should also provide information on how the actions, policies and measures are modifying longer-term trends in GHG emissions and removals.

Table 9 summarizes the information to be reported in the BTR with regards to mitigation policies and measures. However, it is important to emphasize that this table does not necessarily reflect the common tabular format which will be adopted.

Table 9. Information to be provided in BTR on mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans. In italics, "should", "encouraged", and "may" requirements. Requirements where flexibility applies are in blue.

Information to report	BTR requirements ³²
	Name

³² For relevant guidance on methodologies to provide the requested information see the ICAT Toolboxes at the end of this Chapter.

Information on actions, policies and measures ³³ (tabular format in BTR)	Description
	Objectives
	Type of instrument (regulatory, economic instrument or other)
	Status (planned, adopted or implemented)
	Sector(s) affected
	Gases affected
	Start year of implementation
	Implementing entity or entities
	Estimates of expected and achieved GHG emissions reductions (encouraged, if flexibility is needed)
	Costs (may)
	Non-GHG mitigation benefits (may)
How the mitigation actions interact with each other (may report)	
Information on actions, policies and measures ³⁴ (in narrative format or annex to the BTR)	Methodologies and assumptions used to estimate the GHG emissions reductions or removals by each action, policy and measure
	<i>Those actions, policies and measures that are no longer in place compared with the most recent BTR, and why they are no longer in place (should report)</i>
	<i>Actions, policies and measures that influence GHG emissions from international transport (should report)</i>
	<i>How the actions, policies and measures are modifying longer-term trends in GHG emissions and removals (should report)</i>
	<i>Assessment of economic and social impacts of response measures (encouraged to provide detailed information)</i>
Adaptation actions and/or economic diversification plans resulting in mitigation co-benefits	Sectors and activities associated with response measures
	Social and economic consequences from the response measures action
	Challenges and barriers to address the consequences
	Actions to address the consequences

³³ Including adaptation actions and economic diversification plans with mitigation co-benefits.

³⁴ Including adaptation actions and economic diversification plans with mitigation co-benefits.

Source: Dal Maso, M., & Canu, F.A. 2019. *Unfolding the reporting requirements for Developing Countries under the Paris Agreement’s Enhanced Transparency Framework.*

A3.6. Projections of GHG Emissions and Removals

Countries are requested to provide projections of GHG emissions and removals, although developing countries that need flexibility in the light of their capacities are only encouraged to report these projections. Projections of GHG emissions and removals will provide quantitative information of the impact of mitigation policies and measures. When reporting projections, countries shall report a ‘with measures’ projection of all GHG emissions and removals, i.e. including currently implemented and adopted policies and measures. Countries may report a ‘with additional measures’ projection including implemented, adopted and planned policies and measures, and a ‘without measures’ projection excluding all policies and measures implemented, adopted and planned.

The projections have to be presented in graphical and tabular formats, be provided with and without LULUCF, and include projections by sectors and by gas, as well as cumulative at national level, using a common metric consistent with the one used in the estimation of GHG inventory. In addition, projections of key indicators to determine progress towards its NDC needs to be provided.

Table 10. Information to be provided in BTR on projections of GHG emissions and removals. In italics, "should", "encouraged", and "may" requirements. Requirements where flexibility applies in blue.

Information to report	BTR requirements ³⁵
Time coverage	From the latest NIR, and covering at least 15 years beyond the next year ending in zero or five. (Extend their projections at least to the end point of their NDC, if flexibility is needed)
Time coverage with flexibility	At least to the end point of the NDC
Structure (flexibility to report less detailed information)	Graphical and tabular formats
	On a sectoral basis and by gas, as well as for the national total
	With and without LULUCF
	‘with measures’ projection
	‘with additional measures’ projection and ‘without measures’ projection, if relevant
	Presented relative to actual inventory data for the preceding years
NDC Indicators	Projections of key indicators to determine progress towards its NDC are also to be provided

³⁵ For relevant guidance on methodologies to provide the requested information see the ICAT Toolboxes at the end of this Chapter.

Methodologies	<i>Models and/or approaches used and key underlying assumptions and parameters used for projections (e.g. gross domestic product growth rate/level, population growth rate/level)</i>
	<i>Changes in the methodology since the most recent BTR</i>
	<i>Assumptions on policies and measures included in the ‘with measures’ projection and ‘with additional measures’ projection, if included</i>
	<i>Sensitivity analysis for any of the projections, together with a brief explanation of the methodologies and parameters used</i>

Source: Dal Maso, M., & Canu, F.A. 2019. *Unfolding the reporting requirements for Developing Countries under the Paris Agreement’s Enhanced Transparency Framework.*

A3.7. Information on Support Needed and Received

Table 11 lists the requested information that countries should provide in a common tabular format (expected end 2021) on each relevant activity, programme or project needed or received. **Table 12** summarizes the information on support needed and received to be provided in the BTR.

Table 11. Information to report in the BTR on support needed and received, in common tabular format.

	FN	FR	TDTN	TDTR	CBN	CBR	ST
Title	X	X	X	X	X	X	X
Programme/project description	X	X	X	X	X	X	X
Channel		X					X
Recipient Entity		X		X		X	X
Implementing entity		X		X		X	
Type of technology			X	X			
Estimated or actual amount (domestic currency and USD)	X	X					X
Expected or actual time frame	X	X	X	X	X	X	X
Expected or utilized financial instrument (e.g. grant, concessional / non-concessional loan, equity, guarantee)	X	X					
Status (committed or received)		X					
Type of support (mitigation, adaptation or cross-cutting)	X	X	X	X	X	X	
Sector and subsector	X	X	X	X			
Whether the activity will contribute to technology development and transfer and/or capacity-building	X	X					

Status of activity (planned, ongoing or completed)		X		X		X	X
Whether the activity is anchored in a national strategy and/or an NDC	X						
Expected and achieved use, impact and estimated results	X	X	X	X	X	X	X

Source: Dal Maso, M., & Canu, F.A. 2019. *Unfolding the reporting requirements for Developing Countries under the Paris Agreement's Enhanced Transparency Framework.*

FN= Financial support needed; FR= financial support received; TDTN= technology development and transfer support needed; TDTR= Technology development and transfer support received; CBN= Capacity-building support needed; CBR= Capacity-building support received; ST= Support needed and received for the implementation of Article 13 of the PA and transparency activities.

Table 12. Information to be provided in BTR on support needed and received. In italics, "should", "encouraged", and "may" requirements.

Information to report	BTR requirements
National circumstances, institutional arrangements and country-driven strategies	<i>The systems and processes used to identify, track and report support needed and received</i>
	<i>A description of the challenges and limitations to identify, track and report support needed and received</i>
	<i>Information on country priorities and strategies and on any aspects of the Party's NDC under Article 4 of the Paris Agreement that need support</i>
Underlying assumptions, definitions and methodologies used to:	<ul style="list-style-type: none"> (a) <i>Convert domestic currency into United States dollars;</i> (b) <i>Estimate the amount of support needed;</i> (c) <i>Determine the reporting year or time frame;</i> (d) <i>Identify support as coming from specific sources;</i> (e) <i>Determine support as committed, received or needed;</i> (f) <i>Identify and report status of the supported activity (planned, ongoing or completed);</i> (g) <i>Identify and report the channel (bilateral, regional or multilateral);</i> (h) <i>Identify and report the type of support (mitigation, adaptation or cross-cutting);</i> (i) <i>Identify and report the financial instrument (grant, concessional loan, non-concessional loan, equity, guarantee or other);</i> (j) <i>Identify and report sectors and subsectors;</i>

	<p><i>(k) Report on the use, impact and estimated results of the support needed and received;</i></p> <p><i>(l) Identify and report support as contributing to technology development and transfer and capacity-building;</i></p> <p><i>(m) Avoid double counting in reporting information on support needed and received for the implementation of Article 13 of the Paris Agreement and transparency-related activities, including for transparency-related capacity-building, when reporting such information separately from other information on support needed and received.</i></p>
Information on financial support needed	<i>Sectors for which the Party wishes to attract international finance, including existing barriers to attracting international finance</i>
	<i>Description of how the support will contribute to its NDC and to the long-term goals of the Paris Agreement</i>
Information on financial support received	<i>Information on financial support received to implement mitigation contributions</i> Error! Reference source not found.
Information on technology development and transfer support needed	<i>Plans, needs and priorities related to technology development and transfer, including those identified in Technology Needs Assessments, where applicable</i>
	<i>Technology development and transfer related needs for the enhancement of endogenous capacities and technologies</i>
Information on technology development and transfer support received	<i>Case studies, including key success and failure stories</i>
	<i>How the support contributes to technology development and transfer, endogenous capacities and know-how</i>
	<i>The stage of the technology cycle supported, including research and development, demonstration, deployment, diffusion and transfer of technology</i>
Information on capacity-building support needed	<i>The approach a Party seeks to take to enhance capacity-building support</i>
	<i>Country-specific capacity-building needs, constraints and gaps in communicating those needs, and an explanation of how the capacity-building support needed would improve the provision of such information</i>
	<i>Processes for enhancing public awareness, public participation and access to information in relation to capacity building</i>
Information on capacity-building support received	<i>Case studies, including key success and failure stories</i>
	<i>How support received has enhanced a Party's capacity</i>

	<i>Capacity-building support received at the national and, where appropriate, sub-regional and regional level, including priorities, participation and the involvement of stakeholders</i>
Information on support needed and received for the implementation of Article 13 and transparency-related activities, including for transparency-related capacity-building	<i>Support needed and received for preparing reports pursuant to Article 13</i>
	<i>Support needed and received for addressing the areas for improvement identified by the technical expert review teams</i>

Source: Dal Maso, M., & Canu, F.A. 2019. Unfolding the reporting requirements for Developing Countries under the Paris Agreement's Enhanced Transparency Framework.