Initiative for Climate Action Transparency - ICAT -

INSTITUTIONAL ARRANGEMENTS FOR VIETNAM'S MRV /TRANSPARENCY SYSTEM

– EXAMPLES FROM THE ENERGY AND AGRICULTURE SECTORS

Hanoi, 2021

Initiative for Climate Action Transparency - ICAT -

Institutional arrangements for Vietnam's MRV/Transparency system – an example on energy and agriculture sectors

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Acronyms and abbreviations

BR	Biennial Report
BTR	Biennial Transparency Report
BUR	Biennial Update Report
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CO_2eq	Carbon dioxide equivalent
COP	Conference of Parties
DCC	Department of Climate Change
ETF	Enhanced Transparency Framework
GHG	Greenhouse Gas
GL	Guideline
GSO	General Statistics Office
GWP	Global Warming Potential
NDCs	Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
LDCs	Least Developed Countries
LULUCF	Land Use, Land-Use Change and Forestry
MARD	Ministry of Agriculture and Rural Development
MOC	Ministry of Construction
MOF	Ministry of Finance
MOIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MOT	Ministry of Transport of Vietnam
MPGs	Modalities, Procedures and Guidelines

MPI	Ministry of Planning and Investment
MRV	Measurement, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
NC	National Communication
NDC	Nationally Determined Contribution
NIR	National Inventory Report
SIDS	Small Island Developing States
QA	Quality Assurance
QC	Quality Control
TER	Technical Expert Review
UNFCCC	United Nations Framework Convention on Climate Change

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INTRODUCTION

This report presents the contents about Institutional arrangements for Vietnam's Measurement, Reporting and Verification (MRV)/Transparency System focusing on energy and agriculture sectors. The main content is related to proposing institutional arrangements for tracking progress of Nationaly Determined Contribution (NDC) implementation related to the national greenhouse gas (GHG) inventory system and GHG emissions mitigation.

The Paris Agreement, adopted at the Conference of Parties (COP) 21, is the first international legal document that “brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so” (UNFCCC, 2019). The Parties commit to these ambitious efforts through their NDC.

Article 13 of the Paris Agreement establishes an "Enhanced Transparent Framework (ETF) for action and support". The framework's purpose is to build mutual trust and confidence while promoting effective implementation of the Paris Agreement, by enabling, inter alia, a clear understanding of countries’ efforts in achieving climate change action, as outlined in Article 2 of the framework, including clarity and monitoring the NDC under Article 4 and adaptation actions of each country member under Article 7, including good practice, priorities, requirements and gaps, to provide information for the global stocktake process under Article 14, aimed at assessing countries’ collective efforts under the UNFCCC.

Vietnam, a non-Annex I country, will have to replace Biennial Updated Report (BURs) with Biennial Transparency Reports (BTR) as required by the Paris Agreement by December 31, 2024 at the latest. The transition requires preparation and readiness from now on. In order to meet ETF requirements, Vietnam needs to identify gaps in institutional arrangements for national GHG inventories and tracking progress of mitigation actions. This makes operations and implementation smooth and more flexible. The report focuses on the energy and agriculture sectors including the following main contents:

1. General introduction about enhanced transparency framework;
2. Current Institutional Arrangements in Vietnam;
3. Proposal for a transparent national framework related to institutional arrangements.

1. An overview of the enhanced transparency framework

1.1. Enhanced transparency framework

1.1.1. Background on transparency under Paris Agreement

The Paris Agreement requires its signatory countries (known as Parties) to formulate their own regular climate action plans, so-called NDC. When updated, the NDC must not fall short of the targets applicable prior to the update and should reflect the highest possible level of ambition. Parties are also required to implement measures that contribute to achieving their NDC. There is, however, no obligation under international law to achieve the NDC and no sanctions are provided for in the event of Parties' failure to achieve them.

Against this backdrop, the ETF established by Article 13 of the Paris Agreement is of central importance. It specifies how Parties shall report regularly on their GHG emissions levels and trends, progress made in implementing and achieving their NDC targets and their policies and measures, as well as on their support provided or received. Moreover, the ETF provides for information to undergo international technical expert review.

Overall, the ETF creates the basis for the global community to access and monitor over time countries' efforts and progress against their own announced goals, thus representing a central component to the design, credibility and operation of the Paris Agreement.

The ETF is also an essential part of the NDC cycle. Countries' information, gathered in line with the provisions of the ETF, is fed into the Global Stocktake which every five years will assess collective progress towards the long-term goals of the Paris Agreement. The outcomes of the Global Stocktake are in turn taken into account by countries when updating or submitting new NDCs.

The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Additionally, the agreement aims to increase the ability of countries to deal with the impacts of climate change, and at making finance flows consistent with a low GHG emissions and climate-resilient pathway. To reach these ambitious goals, appropriate mobilization and provision of financial resources, a new technology framework and enhanced capacity-building is to be put in place, thus supporting action by developing countries and the most vulnerable countries, in line with their own national objectives. The Agreement also provides for an enhanced transparency framework for action and support. The big view of transparency perspective is given in the Figure 1.

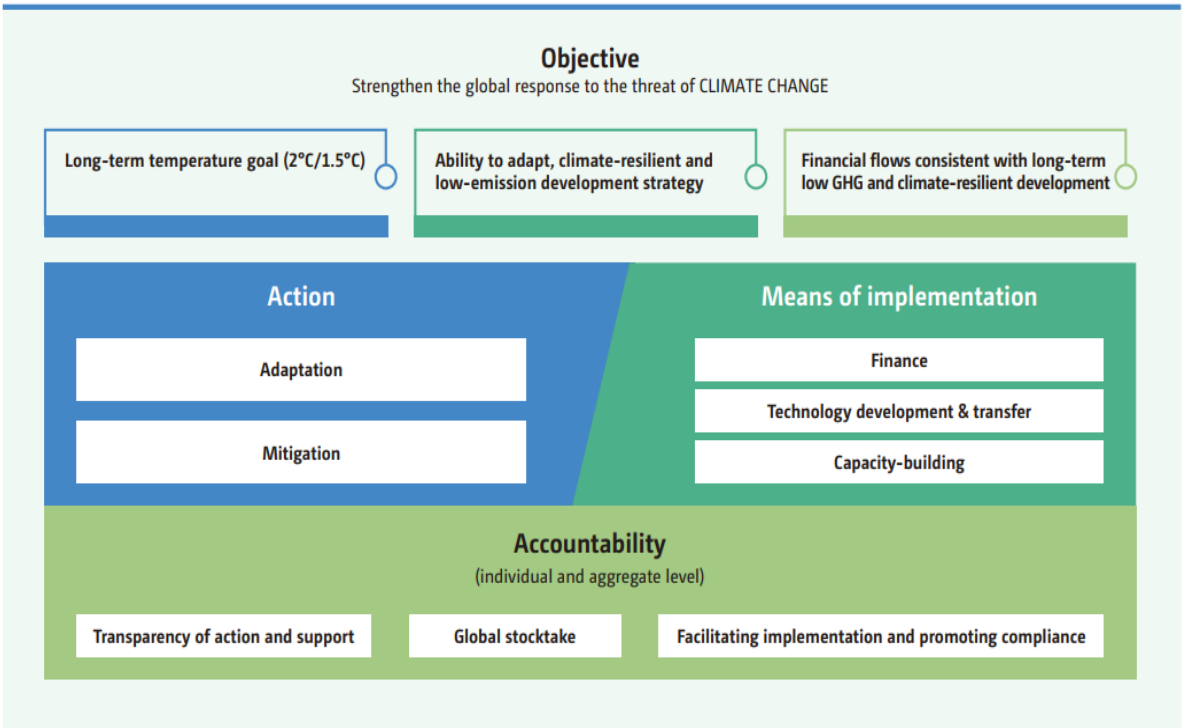


Figure 1: The big picture from transparency perspective

Source: UNFCCC (2020).

In the current transparency arrangements under the UNFCCC Convention, Annex I countries are required to submit Biennial Reports (BRs) and non-Annex I countries are required to submit Biennial Update Reports (BURs), every two years. Moreover, both Annex I and non-Annex I countries are required to submit a National Communication every four years. Non-Annex I countries submit their BURs and NCs matching their competencies and the assistance provided. Vietnam submitted its first BUR in 2014, the second BUR in 2017, and a third BUR has just been submitted in 2021.

In the light of the new arrangements under the Paris Agreement and its ETF, both BRs and BURs will be replaced by the new Biennial Transparency Reports (BTRs), whose first submission is due no later than December 31, 2024. In addition to a BTR, all countries are required to provide a NC every four years (2/CP.17, para.14 and 1/CP.16 para.60(b)). The differences between the existing MRV system and the ETF of the Paris Agreement are summarised in Figure 2.

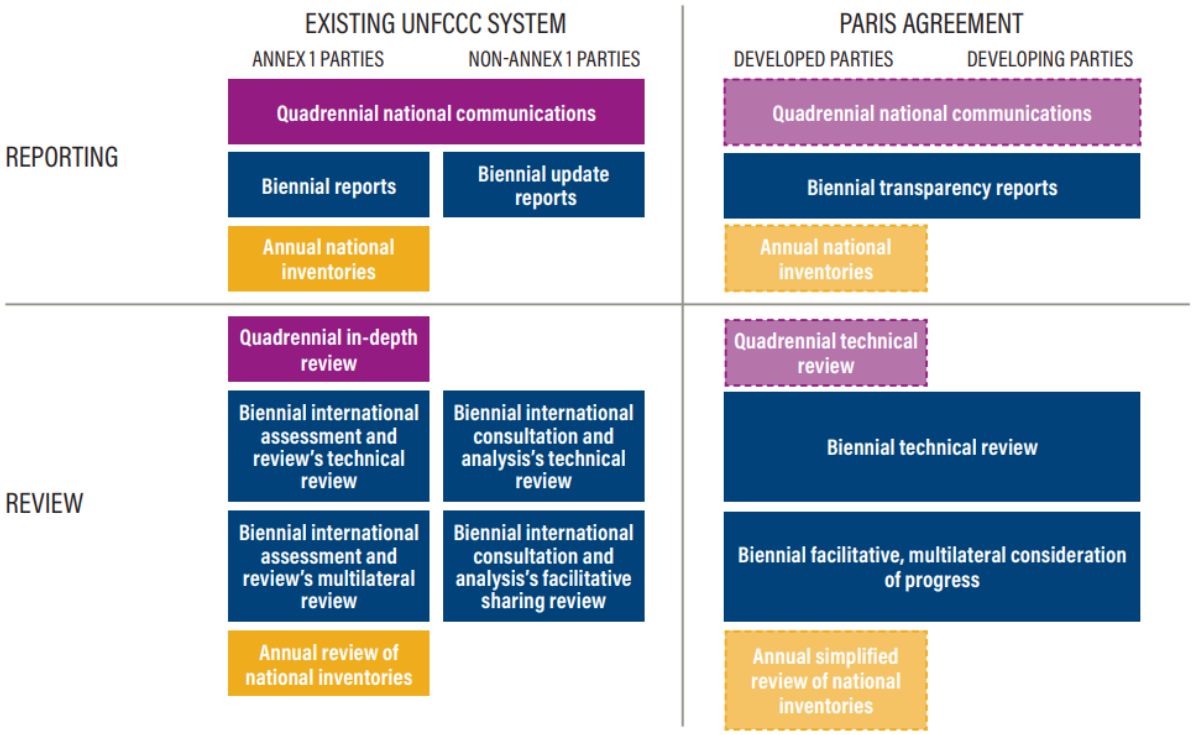


Figure 2: The existing UNFCCC MRV system and the Paris Agreement's Enhanced Transparency Framework

(Source: Updated from Dagnet et al. (2017) based on UNFCCC (2018e).)

1.1.2. The Modalities, Procedures and Guidelines (MPGs) for implementation of the Enhanced Transparency Framework

One major element of the Katowice Climate Package agreed at COP24 is the adoption of common MPGs for the operationalisation of the ETF. The MPGs build on, among other things, experiences from applying transparency-related requirements under the Convention and the Kyoto Protocol. These MPGs apply to all Parties, while providing specific flexibility provisions for those developing countries who do not yet have the capacity to comply with all requirements. Developing country parties can self-determine, based on their own capacities, which of the available flexibility provisions they need to make use of. They will need to explain which flexibility options they choose to use, what the capacity constraints are, and provide estimated timeframes for their improvements.

Under the ETF, the MPGs set out how BTRs will be submitted by all Parties every two years (Least Developed Countries -LDCs- and Small Island Developing States -SIDS- may submit BTRs at their discretion). The information submitted by each Party will undergo a two-step review process.

- Firstly, the BTR will undergo an international technical expert review (TER), and

- Secondly, each Party will participate in a facilitative, multilateral consideration of progress with respect to effort, and its respective implementation and achievement of its NDC.

Figure 3, below, provides an overview of the ETF, reporting formats and review process.

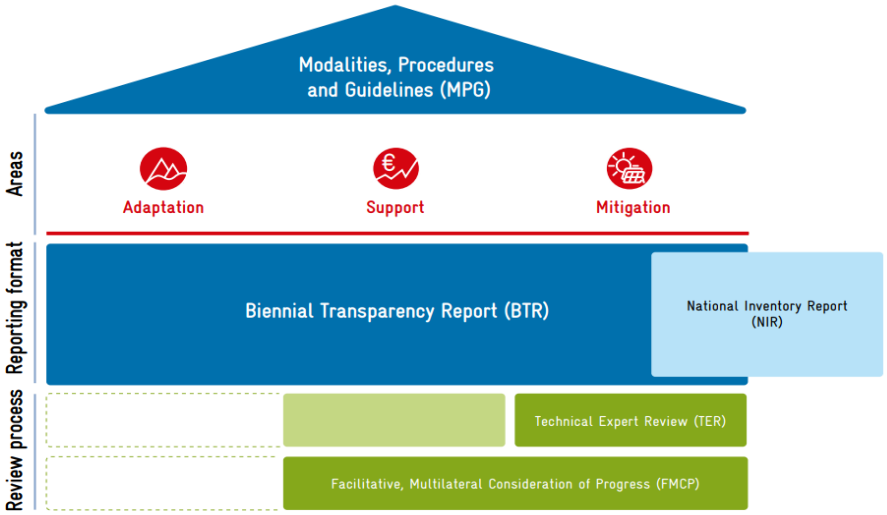


Figure 3: Overview of the Enhanced Transparency Framework

Source: GIZ (2019).

Until BTRs will supersede the current biennial reporting requirements, developing countries will continue to submit BURs and by doing so, they will gain the experience needed to comply with the new transparency requirements under the Paris Agreement. It is worth noting that, under the ETF, Parties will have the option of integrating their BTR into their NC submission by adding more chapters or add the additional chapters of the NC into the BTR, with the view of avoiding repetitions.

The MPGs, as shown in the Figure 4, specify the content of BTRs and include detailed guidance on the following:

- National inventory report on anthropogenic emissions by sources and removals by sinks of GHGs (submitted as a stand-alone report or as a component of the BTR) (mandatory);

- Information needed to track progress made in implementing and achieving the NDCs (mandatory);

- Information related to climathe change impacts and adaptation (this has a clear link to the Adaptation Communication, which can be submitted separately or linked to the BTR) (voluntary);

- Information on financial support, technology development and transfer as well as capacity building support needed and received (voluntary for developing countries);

- Information on financial support, technology development and transfer as well as capacity building support provided and mobilised (mandatory for developed countries; voluntary for other countries);

- Flexibility options chosen, relevant capacity constraints and improvement timeframes (for those developing countries who need flexibility in the light of their capacities).

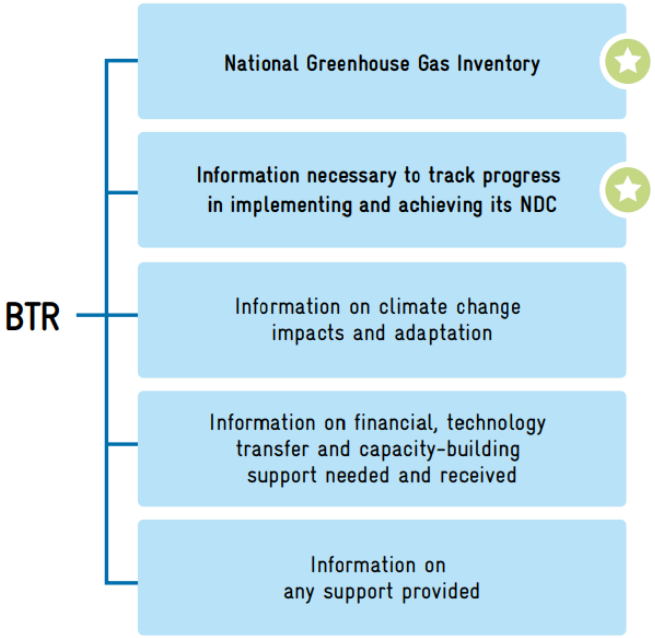


Figure 4: Key elements of the Biennial Transparency Report for developing countries

Source: GIZ (2019).

1.1.3. ETF preparation

The ETF is built based on the existing MRV framework. As such, all countries will already be meeting some requirements under the ETF. But inevitably there will be initial gaps in meeting the requirements of the ETF, especially amongst developing countries. In the time preceeding the submission of the first BTR by the end of 2024, it is therefore essential that each country takes stock of the current domestic situation, identifies necessary improvement and develops a roadmap for how those will be implemented and achieved between now and 2024. This roadmap should ideally identify what needs to be done to become 'ETF-ready', when these activities should happen and who will be involved.

Whilst not a requirement of the Paris Agreement, such a roadmap for becoming 'ETF-ready' would have a number of benefts. In particular, it will ensure a smooth

transition to the ETF and allow for certain aspects of the ETF reporting to be introduced over time, in a step-wise manner. Doing this will mean a smoother schedule of capacity building rather than trying to do too much in a short space of time near to the 2024 deadline. To develop such a roadmap, countries will obviously need to understand the requirements under the ETF and how they differ from the current MRV framework and the main difference between BURs and BTRs. Appendix 4 provides an overview of the main changes between the BURs (current reporting requirements as of 2019) and the BTRs (reporting requirement from 2024). Main changes consist in ensuring completeness and accuracy of the information reported in the GHG inventory, and in tracking progress; reporting on the implementation and achievement of the NDC.

- In terms of **GHG inventories**: all countries will need to use the 2006 Intergovernmental Panel on Climate Change Guidelines (2006 IPCC GLs) (and any subsequent refinements adopted by the CMA) and use the Global Warming Potentials (GWP) of the Fifth Assessment Report by the IPCC. All countries are also requested to perform mandatory key category analysis, make every effort to apply higher tier methods to the key categories, report consistent times series, conduct uncertainty analysis and implement Quality Assurance/Quality Control (QA/QC) plans;
- Regarding reporting on **NDC mitigation efforts**: all countries will need to provide a description of their NDCs and information on relevant indicators needed to track progress in their implementation. For developing countries, this is an important addition, as they will need to report on the implementation and achievement of their mitigation goals for the first time. The indicators can be quantitative or qualitative and indicator data has to be provided for all reporting years. The MPGs specify that each Party shall report on GHG projections and gives details on how this should be done. However, developing country Parties are only encouraged to do so by using simpler methodologies. The MPGs state that GHG projections cannot be used to track progress unless the Implementing Party is assessing GHG emissions based on a baseline emission curve.
- Information on **climate change impacts and adaptation** action is also a new element in the BTRs but it is not mandatory. Additional information to be reported includes **support provided and mobilized**. In addition to developed countries, for whom it is mandatory, other countries that provide support should also report this information as part of their BTRs. Finally, developing countries should report with a higher level of detail on **support needed and received** than currently within the scope of the BURs. Although reporting on adaptation action and on support needed and received are not mandatory ("should") for developing countries under the ETF, they are important elements. Reporting on support needed and received will make it easier for developing

countries to attract the support necessary for effective implementation of their NDCs.

Understanding the requirements of the ETF and the differences between BURs and BTRs will help the process of preparing of development countries for ETF-ready goes smoothly. Figure 5 shows an example of roadmap to get an ETF-ready.

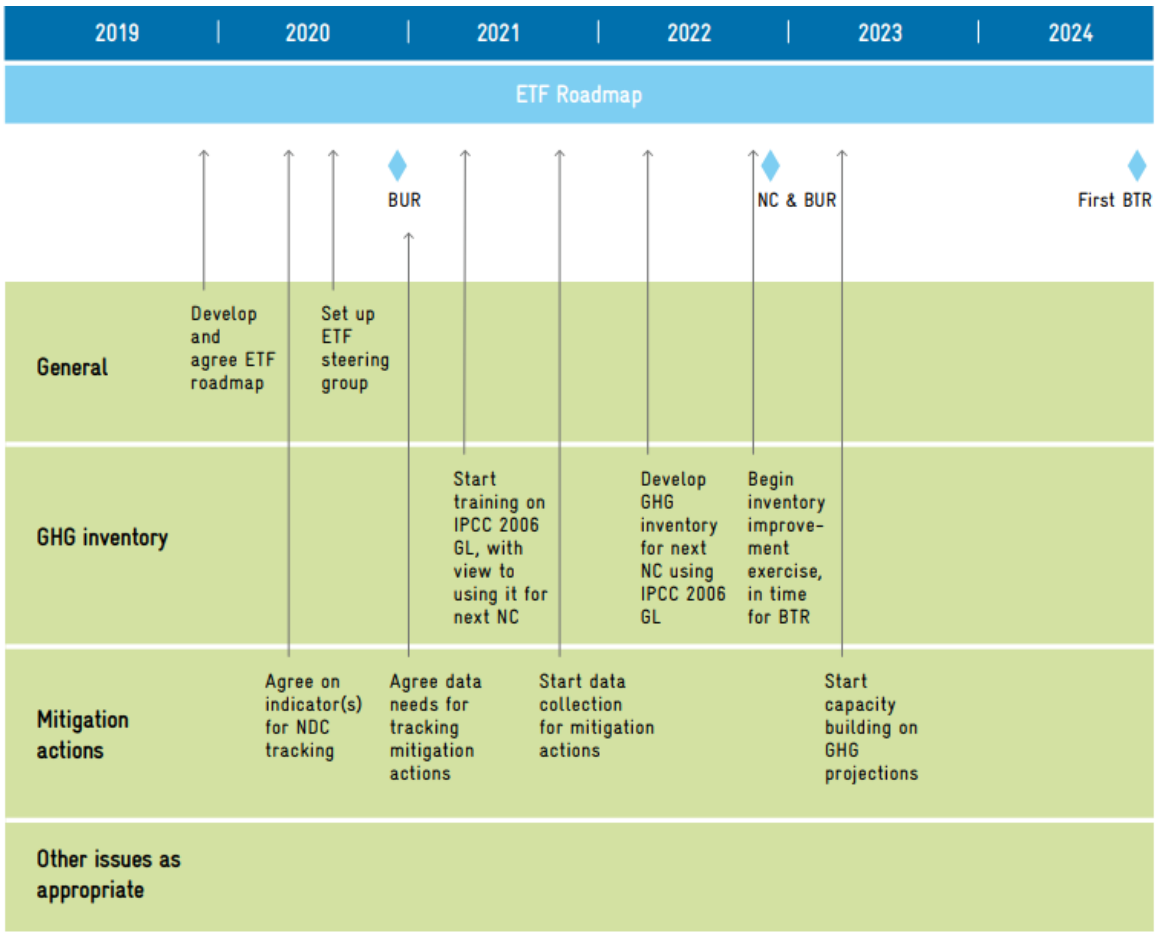


Figure 5: ETF- ready roadmap

Source: GIZ (2019).

1.2. Key elements of national transparancy system

As the Figure 5 above, five key contents of BTR are: (1) National GHG inventory; (2) Information necessary to track grogress in implementing and achieving its NDC; (3) Information on climate change impacts and adaptation; (4) Information on financial, technology transfer and capacity building support needed and received; (5) Information on any support provided. In the scope of this report, we only focus on the requirement of the transparency system for national GHG inventory and tracking progress to achieving NDCs.

1.2.1. Transparency system for national GHG inventory

The national ETF for GHG inventory will be built based on the MRV framework for national GHG inventory under the UNFCCC. For the activities of GHG inventory, each Party should implement and maintain national inventory arrangements, including institutional, legals and procedural arrangements for the continued estimation, complilation and timely reporting of national inventory reports in accordance with these MPGs. The functions related to inventory planning, preparation and management can be summarized as follows:

- Identification of the national entity or national focal point with overall responsibility for the national GHG inventory;
- Inventory preparation process;
- 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 QA/QC, review results and planned inventory improvement; and
- Processing for the official consideration and approval of the inventory.

To meet the ETF's requirement for the national GHG inventory, countries need to comply with the following elements:

Methodologies, parameters and data

- Mandatory use of the 2006 IPCC GLs, and of any subsequent verson or refinement of the IPCC GLs agreed upon by the Conference of the Paties serving as the meeting of the Parties to the Paris Agreements (CMA);
- Each Party should make every effort to use a recommended method (tier level) for key categories in accordance with those IPCC GLs;
- A Party may be unable to adopt a higher tier method for a particular key category owing to lack of resources. In such cases, the Party may use a tier 1 approach, and shall clearly document why the methodological choice was not in line with the corresponding decision tree of the IPCC GLs referred;
- Each Party is encouraged to use country-specific and regional emission factors and activity data, where available, or to propose plans to develop them, in accordance with the good practice elaborated in the IPCC GLs.

Key category annalysis

- Identify key categories including and excluding LULUCF categories, using approach 1, for both level and trend assessment, by implementing a key category analysis consistent with IPCC GLs. Those developing country Parties that need flexibility in the light of their capacities with respect to this provision have the possibility to identify key categories using a threshold no lower than 85 per cent in place of the 95

per cent threshold defined in the IPCC GLs, allowing to focus on improving fewer categories and prioritizing resources.

Time-series consistency and recalculations

- To ensure time-series consistency, the same approach to underlying activity data and emission factors should be used for each reported year;
- For missing activity data, emission factors or other parameters, surrogate data, extrapolation, interpolation and other method consistent with splicing techniques contained in the IPCC GLs should be used to ensure a consistent time series;
- The recalculations need to be implemented in accordance with the IPCC GLs to ensure the emission trends are not changed when using other methods or assumption across the time series.

Uncertainty assessment

- The uncertainty of emission and removal for source and sink categories and the trend uncertainty should be estimated, for at least reporting year of the inventory time series, using at least approach 1 as provided in the IPCC GLs. Those developing country Parties that need flexibility in the light of their capacities with respect to this provision have the possibility to instead provide, at a minimum, a qualitative discussion of uncertainty for key categories, using the IPCC GLs, where quantitative input data are unavailable to quantitatively estimate uncertainties, and are encouraged to provide a quantitative estimate of uncertainty for all source and sink categories of the GHG inventory.

Assessment of completeness

- Indicating the sources and sinks (categories, pools, and gases) that are not considered in the National Inventory Report (NIR) but for which estimation methods are included in the IPCC GLs and explain the reasons for such exclusion;
- Using notation keys where where numerical data are not available when completing common reporting tables, indicating the reasons why emissions from sources and removals by sinks and associated data for specific sectors, categories and subcategories or gases are not reported. These notation keys include: NO (not occurring); NE (not estimated); NA (not applicable); IE (included eslewhere); C (confidential);
- The notation key “NE” (not estimated) may be used when the estimates would be insignificant in terms of level according to the following considerations: emissions from a category should only be considered insignificant if the likely level of emissions is below 0.05 per cent of the national total GHG emissions, excluding LULUCF, or 500 kilotonnes of carbon dioxide equivalent (kt CO_2eq), whichever is lower. The total national aggregate of estimated emissions for all gases from categories considered

insignificant shall remain below 0.1 per cent of the national total GHG emissions, excluding LULUCF. Parties should use approximated activity data and default IPCC emission factors to derive a likely level of emissions for the respective category. Those developing country Parties that need flexibility in the light of their capacities with respect to this provision have the possibility to instead consider emissions insignificant if the likely level of emissions is below 0.1 per cent of the national total GHG emissions, excluding LULUCF, or 1,000 t CO_2eq, whichever is lower. The total national aggregate of estimated emissions for all gases from categories considered insignificant, in this case, shall remain below 0.2 per cent of the national total GHG emissions, excluding LULUCF;

- The emission or removal sources which have been estimated for a category and if they continue to occur should be reported in subsequent submissions.

Quality assurance/quality control

- Elaborate an inventory QA/QC plan in accordance with the IPCC, including information on the inventory agency responsible for implementing QA/QC; the developing countries that need flexibility in the light of their capacities with respect to this provision are instead encouraged to elaborate an inventory QA/QC plan in accordance with the IPCC GLs, including information on the inventory agency responsible for implementing QA/QC.

- The developing contries are encouraged to implement and provide information on general inventory QC procedures in accordance with its QA/QC plan and the IPCC GLs. In addition, QA procedures should be implemented by conducting a basic expert peer review of their inventories in accordance with the IPCC GLs;

- Compare the national estimates of CO_2 emissions from fuel combustion with those obtained using the reference approach, as contained in the IPCC GLs and report the results of this comparison in its NIR.

Metrics

- Using the 100-year time-horizon GWPvalues from the IPCC Fifth Assessment Report, or 100-year time-horizon GWP values from a subsequent IPCC assessment report as agreed upon by the CMA, to report aggregate emissions and removals of GHGs, expressed in CO_2eq.

Reporting

- Providing a NIR of anthropogenic emissions by sources and removals by sinks of GHGs. The NIR consists of a national inventory document and the common reporting tables;

- Reporting the methods used, including the rationale for the choice of methods, in accordance with good practice elaborated in the IPCC GLs and the

descriptions, assumptions, references and sources of information used for the emission factors and activity data used to compile the GHG inventory;

- Providing information on the category and gas, and the methodologies, emission factors and activity data used at the most disaggregated level, to the extent possible, according to the IPCC GLs;
- Describing the key categories, including information on the approach used for their identification, and information on the level of disaggregation used;
- Reporting the individual and cumulative percentage contributions from key categories, for both level and trend, consistent with the IPCC GLs;
- Reporting recalculations for the starting year and all subsequent years of inventory time series, together with explanatory information and justification for recalculations with an indicator of relevant changes and their impact on the emission trend;
- Reporting the result of the uncertainty analysis as well as as methods used, underlying assumptions, as applicable, and trends, at least for the starting year and the latest reporting year of the inventory time series;
- Reporting information on the reasons for lack of completeness, including information on any methodological or data gaps;
- Reporting the QA/QC plan and information on QA/QC procedures already implemented or to be implemented in the future;
- Reporting estimates of emissions and removals for all categories, gases and carbon pools considered in the GHG inventory throughout the reported period on a gas-by-gas basis in units of mass at the most disaggregated level, in accordance with the IPCC GLs. Using the common reporting tables, including a descriptive summary and figures underlying emission trends, with emissions by sources listed separately from removals by sinks, except in cases where it may be technically impossible to separate information on emissions and removals in the LULUCF sector, and noting that a minimum level of aggregation is needed to protect confidential business and military information;
- Reporting (mandatory) the three gases CO_2, CH_4 and N_2O, as well as any of the additional four gases (HFCs, PFCs, SF_6 and NF_3) that are included in the Party's NDC under Article 4 of the Paris Agreement, are covered by an activity under Article 6 of the Paris Agreement, or have been previously reported;
- Reporting HFCs, PFCs, SF_6 and NF_3 shall report actual emissions of the gases, providing disaggregated data by chemical (e.g. HFC-134a) and category in units of mass and in CO_2eq;
- Reporting the following sectors: energy, industrial processes and product use, agriculture, LULUCF and waste, according to the IPCC GLs;

- Providing information on the following precursor gases: carbon monoxide (CO), nitrogen oxides and non-methane volatile organic compounds (NMVOCs), as well as sulfur oxides;

- Reporting indirect CO_2 from the atmospheric oxidation of CH_4, CO and NMVOCs;

- Reporting international aviation and marine bunker fuel emissions as two separate entries and should not include such emissions in national totals but report them distinctly, if disaggregated data are available, making every effort to both apply and report according to the method contained in the IPCC GLs;

- Clearly indicating how feedstocks and non-energy use of fuels have been accounted for in the inventory, under the energy or industrial processes sector, in accordance with the IPCC GLs;

- Addressing the emissions and subsequent removals from natural disturbances on managed lands in its national GHG inventory. Reporting information on the approach taken, and how it is consistent with IPCC GLs, as appropriate, and indicating (not mandatory) if the estimates are indicated in national totals;

- Using an approach to reporting emissions and removals from harvested wood products in accordance with IPCC GLs other than the production approach;

- Reporting a consistent annual time series;

- The latest reporting year shall be no more than two years prior to the submission of its NIR; for developing countries that need flexibility in the light of their capacities with respect to this provision have the flexibility to instead have their latest reporting year as three years prior to the submission of their NIR.

1.2.2. Transparency system for tracking progress towards implementation and achievement of nationally determined contributions

The national circumstances relevant to progress made in implementing and achieving a Party's NDCs under Article 4 of the Paris Agreement, include:

- Government structure;
- Population profile;
- Geographical profile;
- Economic profile;
- Climate profile;
- Sector details.

To ensure the transparency, each Party shall provide information on the institutional arrangements in place to track progress made in implementing and achieving its NDC under Article 4, including those used for tracking internationally transferred mitigation outcomes, if applicable, along with any changes in institutional arrangements since its most recent BTR. And provide information on legal,

institutional, administrative and procedural arrangements for domestic implementation, monitoring, reporting, archiving of information and stakeholder engagement related to the implementation and achievement of its NDC under Article 4.

Information necessary to track progress made by each Party in implementing and achieving its NDC under Article 4 of the Paris Agreement are:

- Identifying the indicator(s) that each Party has selected to track progress towards the implementation and achievement of its NDC under Article 4. Indicators shall be relevant to a Party's NDC under Article 4, and may be either qualitative or quantitative;
- Providing the information for each selected indicator for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), and shall update the information in accordance with any recalculation of the GHG inventory, as appropriate;
- Providing the most recent information for each selected indicator for each reporting year during the implementation period of its NDC under Article 4;
- Comparing the most recent information for each selected indicator to track progress made in implementing its NDC under Article 4;
- For the first BTR that contains information on the end year or end of the period of its NDC under Article 4, each Party shall provide an assessment of whether it has achieved the target(s) for its NDC under Article 4; Providing (not mandatory), in the first BTR, an assessment whether the Party has achieved the taget(s);
- Providing (not mandatory), in the first NDC the information on accounting of its first NDC consistent with decision 4;
- Providing (not mandatory), in the second and subsequent NDC, the information consistent with decision 4/CMA.1 and how its reporting;
- Providing any definitions needed to understand its NDC under Article 4, including those related to each indicator identified, those related to any sectors or categories defined differently than in the national inventory report, or the mitigation co-benefits of adaptation actions and/or economic diversification plans;
- Providing a description of each methodology and/or accounting approach used;
- Providing the information of key parameters, assumption, definitions, data sources, models used, IPCC GLs used, and metrics used;
- Describing for each indicatior identified, how it is related to its NDC under Article 4;
- Explaining how the methodology in each reporting year is consistent with the methodology or methodologies used when communicating the NDC;
- Explaining methodological inconsistencies with its most recent NIR, if applicable;

- Describing how double counting of net GHG emission reductions has been avoided, including in accordance with guidance developed in relation to Article 6, if relevant;

- Providing the information of structure summary to track progress made in implementing and achieving its NDC under Article 4;

- Providing, in adaptation actions and/or economic diversification plans, the information necessary to track progress on the implementation and achievement of the domestic policies and measures implemented to address the social and economic consequences of response measures.

The key elements were shown above to assess the transparency of GHGs inventories and track the progress of NDC implementation. It helps Vietnam has an overview for building an ETF-ready for the BTR construction process. Though the BTR MPGs are the same for all countries, the Paris Agreement recognizes the challenges facing developing contries and thus provides flexibility in fulfilling the requirements to developing country Parties that need it in light of their capacities. So in this report, we also provide lessons learned from developed and developing countries on building a transparent framework for BTR. It will be presented in section 1.3 below.

1.3. International experience in transparency system development

1.3.1. International experience in building the institutation arrangement for transparency system

Based on the requirements which are outlined in sections 1.2.1 and 1.2.2 for national inventory system and tracking progress of NDC implementation, it is found that even with the flexibility provided in specific provisions, much greater effort will be required from developing country Parties to collect, manage, and treat all the necessary data and information to fulfill the reporting requirements every two years. Since the first BTRs are expected to be submitted to the UNFCCC between 2022 and 2024, there is a short window of opportunity to enhance the capacities in developing countries in order to allow for a sustainable, continuous, and smooth transition from the current MRV system (BURs) to the ETF. This represents a major challenge for capacity-building efforts over the next few years. So, the developing contries should create an effective, robust inventory system takes time and significant resources, as well as supportive legislative and institutional instruments. But countries should not wait until they have built the perfect system to engage fully in the regular estimation and reporting of GHG emissions. Here lessons from a developed country (Japan) and a developing country (Ghana and Republic of Korea) illustrate different stages in the process of learning. Because of earlier requirements placed on Japan, the country has progressed significantly in building its capacity and institutional arrangements. Similarly, Ghana is building capacity over time based on its experiences.

For example, it took about 17 years for **Japan** to reach the level of sophistication portrayed in Figure 6 below. The journey started in 1992 with, as in many developing countries, a small inventory team consisting of staff from the Environment Agency and private consultants. Japan enhanced its original MRV system by setting up an inventory committee to develop and review the methodologies for estimating GHG emission reductions and engaging a broader set of stakeholders, including NGOs and academia. Then, Japan improved institutional arrangements further to meet the requirements of the Kyoto Protocol and enhance its quality assurance and quality control processes.

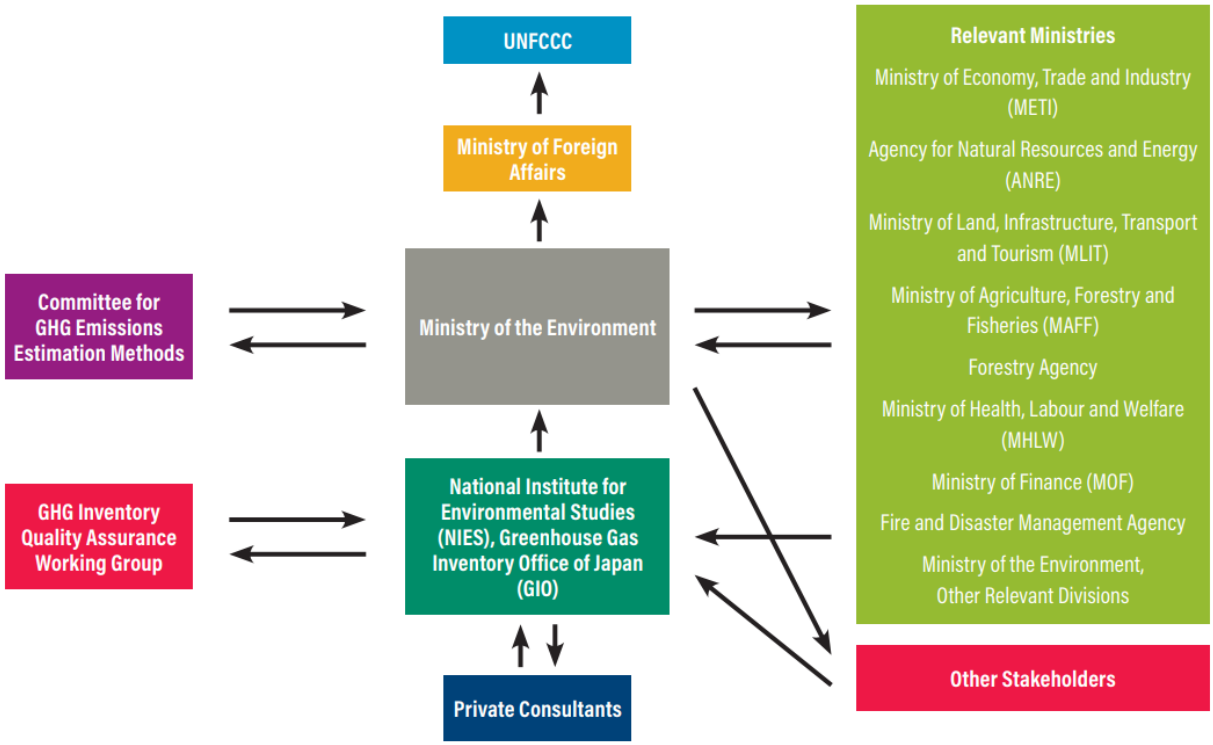


Figure 6: Japan's MRV system

Source: Adapted from Mitsubishi UFJ Research and Consulting (2014)

Figure 6 illustrates a very sophisticated MRV system involving all line ministries but distinguishes the critical role of the national designated entity, the National Institute for Environmental Studies, in data collection, analysis, and recording and in the establishment of advisory bodies to perform quality insurance and verification activities and inform the design of methodologies. Mitsubishi UFJ Research and Consulting (2014) illustrates and discusses the history of Japan's journey in experiences in preparing national GHG inventories. In 1997, an ad hoc expert committee considered revisions to Japan's arrangements. Several years later, the Ministry of Environment was formed and took responsibility for preparing the national inventories. In 2002, Japan created the Greenhouse Gas Inventory Office to organize work in support of the inventory. Throughout this process, Japan continued to engage relevant ministries—

slowly breaking down walls between ministries so that they can now collaborate in a more active way.

Nearly 30 years ago, Japan's process and national arrangements for the inventory consisted of a small team, with limited engagement from other ministries. However, by building its arrangements slowly, Japan was able to work through barriers between ministries and establish a more complex institutional structure. Rushing to implement the current structure at the beginning of the process might have introduced only additional burdens. This example illustrates the importance of building processes over time and continuing to adjust institutional arrangements to best fit into the domestic national circumstances.

In the context of a developing country, **Ghana**'s transparency institutional arrangements are continuing to evolve as it builds its capacity over time and learns from its unique experiences. Ghana's current efforts include the Climate Ambitious Reporting Program (GCARP), which was established in 2013 to enhance domestic MRV systems and improve reporting. The main object of GCARP is to develop a data management system to serve both domestic and international reporting requirements.

Further, one of the four key functions of GCARP is to revise the country's institutional arrangements (Effah and Pahuja, 2015). Updated institutional arrangements were designed to build upon existing relationships and experiences, while bringing together new experts and institutions (Effah and Pahuja, 2015).

Among the lessons and challenges from this project, Ghana noted that full implementation of the program is slow and tough, but that starting anew would be extremely expensive and bring its own challenges (Asubonteng and Benefoh, 2017). An important lesson learned is that it is important to focus on what currently works and strive to strengthen that. This also provides an opportunity for consistent progression and mainstreaming of improvements into the government's way of working (Asubonteng and Benefoh, 2017).

While Japan took time to build its current institutional arrangements, Ghana has noted the importance of "learning by doing" with a plan to build on existing systems and structures with an eye for continuous improvement.

One of the main challenges faced by countries is the data gap—where countries do not have the data they need because of a lack of data supply arrangements or inadequate cooperation from data providers, including other government agencies or private sector companies.

The Republic of Korea's GHG and Energy Target Management System (TMS), established in 2010 as a component of the Korean National Green Growth Strategy, sets targets for businesses and collects data to track progress (Korea Energy Agency,

2015). The development of the TMS was based on thorough consultation and negotiations between the government and private companies to:

- Set specific reduction targets for energy consumption and, more broadly, GHG emissions;

- Design standardized procedures for measurement and reporting (codesigned by the government and companies), setup of independent third-party verification, and public disclosure of data from companies; and

- Generate time-series analysis to track the level of emissions reduction and the degree of compliance with standards (Shrivastava, 2015).

By developing the TMS alongside businesses, the government was able to promote cooperation between the government and the private sector, build trust, and ensure ownership by key stakeholders (Shrivastava, 2015).

Over the 2015–2018 period, the TMS grew from 85 to 840 industrial companies. Company reporting under the system follows a robust annual work cycle that includes setting targets, sharing and verifying implementing plans, and meeting the reporting requirements (Shrivastava, 2015). This annual cycle supports the government's preparation of national communications and biennial update reports. In the end, the TMS provides a model for regular tracking of GHG emissions, with a strong data set, independent expert verification, and a whole-of-government approach (Shrivastava, 2015).

Through lessons learned from countries such as Japan, Ghana and Republic of Korea, Vietnam needs to base itself on the current state of national institutional arrangements and identify difficulties and challenges, thereby drawing on the experiences of other countries to "learning by doing", and enhance and improve the institutional arrangements.

1.3.2. International experience on building transparency system to track progress of NDC implementation

MRV of mitigation actions includes impact assessment and implementation progress related to mitigation actions, as summarised in Figure 7.

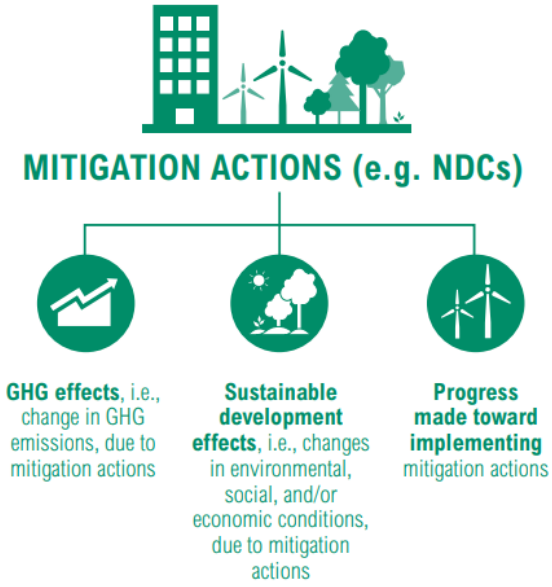


Figure 7: MRV of mitigation

Source: World Resource Institute, 2016, Understanding measurement reporting, and verification of climate change mitigation

Under the Paris Agreement, countries committed to mitigation actions, which are put forth in their respective NDCs. The Agreement also established a transparency framework with common MRV provisions for all countries, with built-in flexibility to take account of countries' different capacities.

With respect to MRV of mitigation actions, the Paris Agreement calls for countries to track progress toward implementing and achieving their NDCs, and report on a regular basis. Accompanying details regarding the kind of information that should be tracked and reported, and the methods to be used – the so called "MPGs" – were developed and adopted in 2018. Some of examples of international experiences below to show how to strengthen capacity to track progress toward national and international commitments and improve the MRV framework for mitigation actions.

The United Kingdom has built a system for tracking progress based on domestic law. The United Kingdom's Climate Change Act 2008 introduced carbon budgets that set legally binding limits on the total GHG emissions allowed in five-year periods. The first budget covered the years 2008–2012. These budgets are used to align the trajectory with the United Kingdom's longterm target of at least an 80 percent reduction in emissions by 2050 compared with 1990 levels. The overall approach of the MRV system includes an annual evaluation of progress toward meeting the carbon budgets, carried out by the independent Climate Change Committee, which prepares a detailed report on national and sectoral GHG emissions as well as a variety of indicators, including at the level of individual mitigation actions. The United Kingdom met the first and second carbon budget targets for 2008–2012 and 2013–2017.

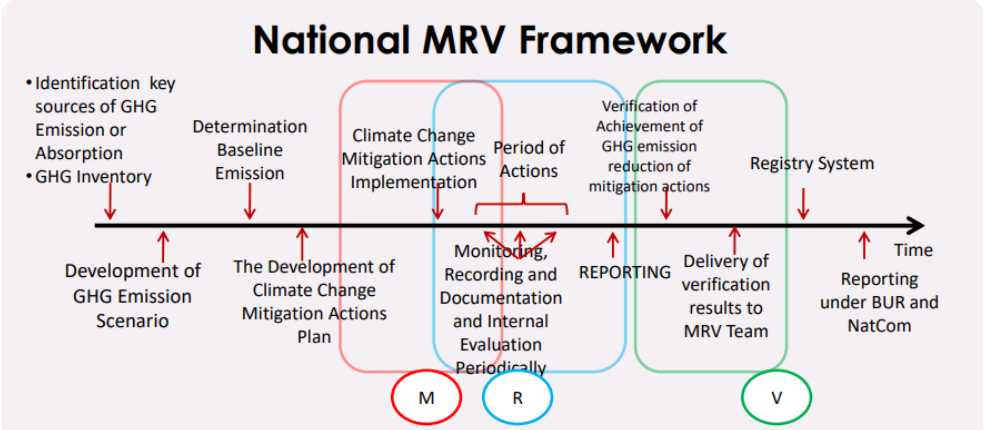
The United Kingdom's underlying MRV system was key to supporting this tracking process. Several elements have been noted as particularly important to the success of this approach (Kilroy et al., 2017):

- Tiered indicators for evaluating policies and measures allow for assessments of emission trends and their causes;
- Wide-ranging data sources provide insights into the reasons for emission trends, including on contextual factors;
- Forward-looking indicators can provide a picture of what needs to happen to meet the budget;
- Preexisting and high-quality emissions data derived from the national GHG inventory are used as the basis to track progress;
- Five-year budgets allow high emissions in one year to be compensated for by lower emissions in another year, as long as the five-year budget is met;
- Independent evaluations by an NGO give the results legitimacy.

While the United Kingdom's experience may not be easily replicated in its entirety, it demonstrates the importance of setting interim or short-term goals and establishing a process to track progress toward these goals within the context of a larger goal.

NAMA framework of **Indonesia** builds upon national mitigation policy framework (inline with long/medium tearm national development plan), national/sub-national mitigation actions plan, etc.). Their NAMA development progress is quite strict, as they have determined that the institutional arrangement for NAMA project is important, the responsibility of ministries, agencies, units are clearly defined. The steps to develop NAMA project can not be complete without the MRV process, because MRV lately become important issue within the context of NAMA to ensure the reliability of emission reductions. Since then, Indonesia has found support to develop their MRV system for NAMA.

The MRV framework of Indonesia was specifically divided implementation responsibilities for each project as shown in Figure 8.



No	Mitigation Actions	M	R	V
1	RAN			
	a. Forestry and Waste Sector	Relevant Directorate Generals in MoEF		DJPPI MoEF
	b. Other sectors (Energy, Transportation, Industry and Agriculture)	Relevant Ministry/ Institutions		DJPPI MoEF
2	REDD+	Project Management		DJPPI MoEF or Third Party
	CDM	Project Proponent		Third Party
	JCM	Project Proponent		Third Party
	Voluntary (VCS, etc.)	Project Proponent		Third Party

Source: Directorate of MPI DJPPI of Indonesia's MoEF, 2015

Figure 8: National MRV framework of Indonesia

Source: Retno Gumilang Dewi (2016)

In terms of institutional arrangements, Indonesia strictly implements, but also encounters difficulties related to baseline development, reduction calculation, MRV setting up, etc while domestic capacities are still limited. Indonesia's institutional arrangement process can be a lesson for Vietnam to further develop the country's transparent system.

In **Republic of Korea,** after determined the reduction of national GHG emission was 30% compared to the BAU scenario by 2020, the Korean Emissions Trading Scheme (KETS) was implemented, it's the second largest carbon market after the European Union Emissions Trading Scheme (EU-ETS) and roughly covering two-third of the country's total emissions. It is the first nationwide emission trading scheme in Asia covering all the energy intensive industries and other facilities. The KETS is the government policy measure taken to reduce its GHG emissions by 30% below its BAU scenario by 2020 thereby meet its commitment laid out in the Copenhagen Accord of 2009. The KETS covered around 600 industrial entities in Phase I (2015-2017) from 23 business categories across five sectors. The KETS has also planned for further Phase II (2018- 2020) and Phase III: (2021-2025) implementations.

For MRV of this program, all activities covered by the KETS, detailed calculation methods, outlining the requirements under all tiers are defined by the regulation. The participating entities have to compile an annual monitoring plan (MP). The authorities check and approve the MP. They also keep track of the progress made by the entities

in their sector throughout the compliance period. The entities must estimate and report the direct and indirect emissions from their respective facilities. The report must also include a distinction between emissions at the corporation level, business site level, facility level and activity level. A tier system, which is comparable to the system under the EU-ETS, has been established, allowing both, calculation and direct measurement approaches. In parallel, entities are classified into groups based on the type of categories and size of the installation to meet the minimum requirement of uncertainty level (tier) in emission estimation.

The lesson of Korea shows that they have identified the optimal way to reduce GHGs emissions for the country through the Korean Emissions Trading Scheme program and focused on implementing this option to meet the specified by government policy. This can also be a lesson for Vietnam through the process of identifying priority mitigation actions which can be reduce GHG emission for Vietnam in order to focus on building institutional arrangements, plans. implementation and transparency system for determined mitigation actions.

1.4. Opportunities and challenges for Vietnam to implement the Enhanced Transparency Framework

Vietnam is a non-Annex I Party, thus the construction and development of an ETF has not yet had an implementation plan.

Currently, Vietnam is in the process of submitting a Measurement, Reporting and Verification (MRV) System for national GHG emission mitigation to the Prime Minister and enclosed with Technical GL for the operation of the national MRV system. Vietnam's ETF development will be based on the approved MRV system. However, Vietnam is currently facing some difficulties and challenges as follows:

Challenges:

- Lacking of clarity and common procedure for implementing mitigation actions and its MRV under limited resources, data and knowledge;
- Lacking of available clarity on financial/technology/capacity building support and its deployment rule for implementation;
- Developing MRV system for sectoral mitigation actions requires strong cooperation and supportive data supply from private sector – who have concerns to ensure the confidentiality and business sensitivity of the their information given;
- The majority of GHG-related data scatters among relevant authorities, while a GHG reporting system may not exist within those authorities.

Opportunities:

- Law of Environment Protection (LEP) had been released in 2020 and it includes a mention to MRV (Item 3 Article 91);
- Decision of the Prime Minister on the national system of GHG inventory; MRV system; the list of fields and GHG emission facilities that must carry out GHG inventory will be issued by the end of 2021;
- Vietnam still has time to learn from other countries' experiences to build a transparent and enhanced nationally appropriate framework.

2. Current institutional arrangements in Vietnam

2.1. National Greenhouse Gas Inventory System

2.1.1. General information

National GHG inventories submitted to the UNFCCC by the Government of Vietnam through NCs and BURs are as listed in Table 1.

Table 1: Completed greenhouse gas inventories in Vietnam

Published	Year of submission	Year of inventory	Method
The First NC	2003	1994	1996 IPCC GL
The Second NC	2010	2000	Revised 1996 IPCC GLs and Good Practice Guidance for the Energy, IP, Agriculture, LULUCF and Waste sectors
The First BUR	2014	2010	Revised IPCC 1996 GLs, GLs for Good Practice and Uncertainty Management in National GHG Inventories (GPG 2000 and GPG LULUCF 2003)
The Second BUR	2017	2013	Revised 1996 IPCC GLs, 2006 IPCC GLs, GPG 2000, GPH LULUCF 2003, ALU Software
The Third NC	2019	2014	Revised 1996 IPCC GLs, 2006 IPCC GLs, GPG 2000, GPG LULUCF 2003, ALU Software
The Third BUR	2021	2016	2006 IPCC GLs, ALU software

As a developing country, there is no clear frequency for the compilation and submission of GHG inventories in Vietnam because of the financing for inventory mostly depending on external support.

2.1.2. Institutional status of the national greenhouse gas inventory system

Organizing the implementation of national GHG inventories is done through the National System of GHG inventories as stipulated in Decision No. 2359/QD-TTg December 22, 2015 of the Prime Minister (Decision) (see Figure 9).

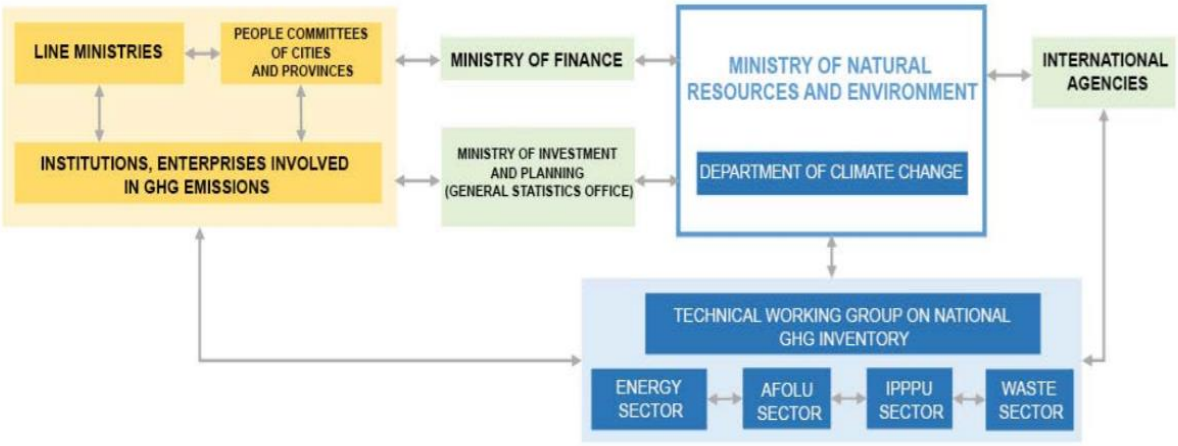


Figure 9: Institutional arrangement of national GHG inventory system in BUR3

Source: MONRE, 2021

The system has been implemented since 2016, focusing on reviewing and supplementing policies and documents related to GHG inventory. The period after 2020 is the period of completing the national system of GHG inventory. GHG emissions management and monitoring will be strengthened. GHG inventory will be made every two years to develop the NC and BUR/BTR based on national funding and funding supports of foreign organizations.

The MONRE, which is in charge of the system, is responsible for coordinating with relevant agencies to conduct GHG inventory in the process of developing the National Report on Climate Change; at the same time ensure the operation of the Steering Committee for the implementation of the Convention on climate change and the implementation of the Kyoto Protocol through the assessment of national reports on climate change, including periodic GHG inventory results.

The Ministry of Investment and Planning shall assume the prime responsibility for, and coordinate with the MONRE in guiding and providing data to relevant agencies and businesses to conduct biennial inventories according the UNFCCC requirements. Central agencies and local governments not only need to collect relevant data and information for the inventory and monitoring of GHG emissions, but also need to

manage the collection and synthesis of relevant data and participate in quality control of activities.

Organizations and businesses involved in GHG consumption and emissions in Vietnam need to provide operational data and information related to GHG inventory under the guidance of the Ministry of Planning and Investment.

The plan to conduct periodic national GHG inventories in accordance with this Decision is described in the Figure 10.

Figure 10: Plan for conducting periodic national GHG inventories

According to the Decision, the budget for GHG inventories is allocated from the State Budget to ministries, agencies and provinces, under the State Budget Law, as well as other financial support.

2.2.2. Shortcoming

According to the Decision, although the institutional arrangements for the national GHG inventory system have been developed and decentralized to ministries and agencies methodically, the implementation process still faces many difficulties and problems in following the implementation process of the Decision:

In legal term:

- The decision does not have enough legal basis for ministries to collect sector-level data.
- The decision does not have regulations on handling violations for non-compliance, leading to the low effectiveness of the Decision.
- The national and sectoral statistical system does not provide enough data to meet and use for national GHG inventories, for example:
    - Energy sector: energy balance sheets provide most of the data on national inventories in the energy sector but are not officially published;

- IP sector: the current statistical system does not provide sufficient information on clinker, limestone and sediment production for the inventory process;
- Agriculture sector: No data are regularly collected and clearly divided into specific rice growing systems;
- LULUCF sector: Land-use matrix provided by the General Department of Land Administration only inventory every 5 years; the data on forest and forest land declaration among ministries is still inconsistent;
- Waste sector: Data on solid waste generation, including domestic, industrial, agricultural, and medical solid waste, and data on waste composition types are incomplete and are not periodically inventoried at the provincial, regional or national level.

In terms of institutional arrangement:

- The current management model of Vietnam's national GHG inventory system is centralized: relevant ministries, provincial/municipal committees, organizations and businesses provide operational data for General Statistics Office (GSO) of the Ministry of Planning and Investment. GSO synthesizes and QA/QC data before sending it to Ministry of Natural Resources and Enviroment (MONRE), however, the data collection systems at the sectoral and subnational levels have not been fully established and/or operationalized so most of the data are still being collected by consultants;
- Most of the emission factors/parameters used are based on the IPCC default values;
- The QA/QC process has not been detailed and strictly implemented;
- Domestic financial resources are still limited; Most GHG inventory activities are carried out under programs and projects, and are funded by international organizations;
- The capacity of domestic inventory experts and the number of experts available for inventory are limited.

Since the data collection systems at sectors level and provincial/municipal level have not been designed or implemented and/or is not fully operational on legal arrangements, most of the activity data for the latest GHG inventory is collected by consultants at the Department of Climate Change (DCC) under MONRE. The collected activity data was then sent to GSO and the line ministries for QA/QC. The feedback from GSO (QA/QC result and activity data) and data from line ministries provide the basis for MONRE to finalize the set of activity data for the calculation of the GHG inventory for each sector.

The data flow in accordance with Decision 2359/QD-TTg and current data flow practice are illustrated in Figure 11.

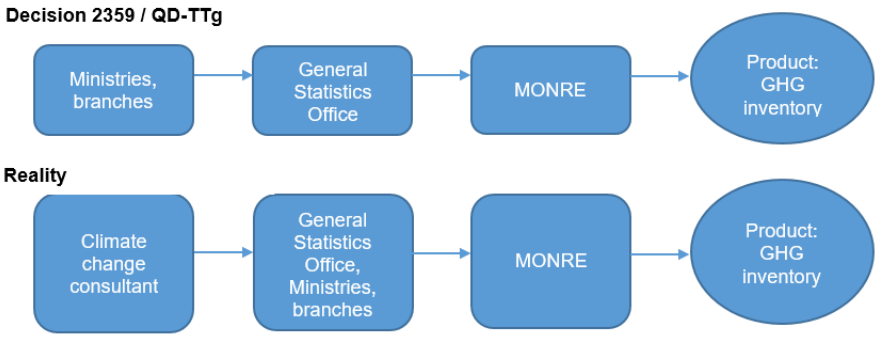


Figure 11. How institutional arrangement works in reality

Source: South Pole, 2020, Align national GHG emission inventory to support market-based carbon pricing approaches

Thus, the national GHG inventory system still has many gaps that need improvement. Institutional arrangements for a GHG inventory system are proposed in part 3 of this report.

Process for implementing national greenhouse gas inventory:

Steps for implementing national GHG inventory for Vietnam are being carried out according to theprocesses described in Figure 12.

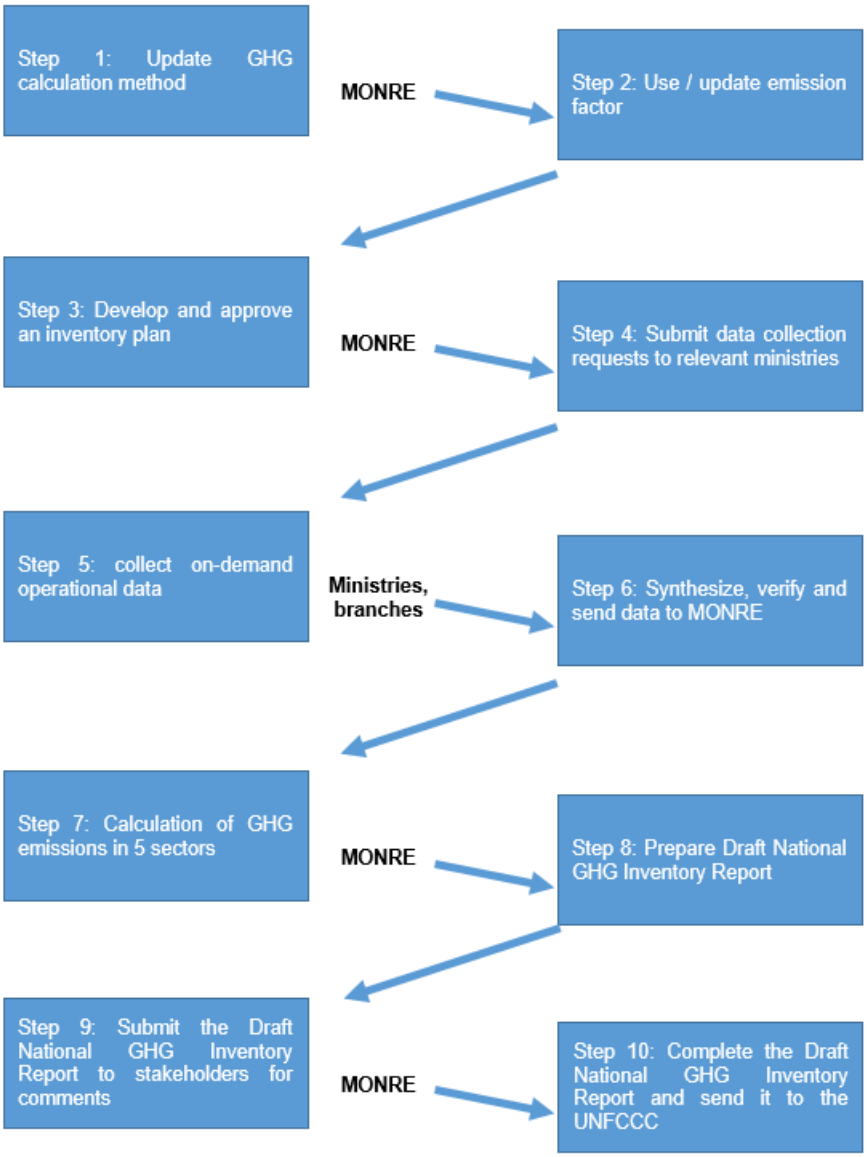


Figure 12: Steps for preparing national GHG inventory reports

(Adopted from National Inventory Report of Vietnam, 2018)

The development of this implementation protocol was established only at the start of GHG inventory project with international fund. There is no formal process, including QA/QC procedures for routine implementation.

Human resources and implementation capacity

The human resource for implementing the national inventory is still limited: for each inventory sector there are only 1-2 employees to conduct the inventory. Human capacity building is needed.

There is a lack of human resources at the local and sectoral levels. In addition, there is a need to improve specific training for the preparation of the national GHG inventory by staff in order to make it easier to select and collect the necessary data..

2.3. Mitigation of greenhouse gas emissions

2.3.1. General information

2.3.1.1. Policies

In recent years, policies related to GHG emissions mitigation of Vietnam have been issued, including: resolution of the Central Committee of the Communist Party of Vietnam on proactive response to climate change, natural resource management and environmental protection (2013); conclusion of the Politburo on promoting proactive response to climate change, strengthening natural resource management and environmental protection (2019); cesolution of the Politburo on the national strategic direction of energy development of Vietnam to 2030, with a vision to 2045 (2020).

Moreover, Vietnam has promulgated and carried out many different mitigation laws, strategies and plans, as summarised in Figure 13.

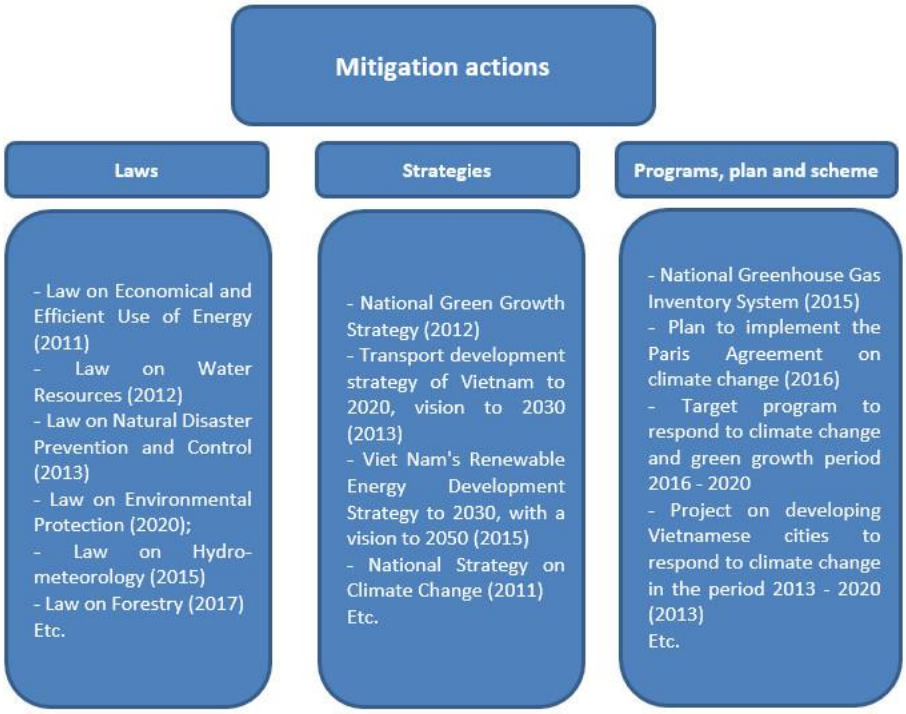


Figure 13: Laws, strategies, programs, plans and schemes indirectly/directly related to GHG emission mitigation of Vietnam

2.3.1.2. Related actions and tasks

Vietnam has implemented a number of activities to reduce GHG emissions in the Energy, Agriculture, LULUCF and Waste sectors, achieving certain results.

In the Energy sector, solutions for economical and efficient use of energy have achieved a reduction in emissions of about 7.3 million tons of CO_2eq in 2014 compared with the previous BAU. In 2014, electricity loss decreased by 1.55% compared to 2010, equivalent to about 2.2 billion kWh, which means energy efficiency has been improved,

and this improvement has helped to reduce emissions by about 1.46 million tons of CO_2eq. Similarly in the period 2015-2019, electricity loss decreased about 29.7 billion kWh, compared to 2010, contributing to reducing emissions by about 26.5 million tons of CO_2eq. Regarding the development of renewable energy by the end of 2019, the total capacity of small hydroelectricity will reach 3,674 MW; wind power is 377 MW; biomass power reaches 325 MW; solar power reached 4,696 MW.

In the Transport sub-category of Energy sector, climate change response is integrated in the process of updating, adjusting, and developing sector strategies and plans, including: detailed planning of seaport groups; the planning for development of Vietnam's dry port system; detailed planning of the dry port system to 2020, with vision to 2030; master plan for inland waterway transportation development; strategy and planning for railway transportation development; planning for Long Thanh airport and other airports. Beside that, in the Energy Industry sub-category, the use of renewable energy in public lighting and traffic signals is also enhanced.

In the Agricultural sector, many activities to reduce GHG emissions have been implemented. Converting long-term rice varieties to short-term varieties both reduces the risk of storms and reduces the time of GHG emissions; increase the area for application of mid-crop water drain and alternate wet-dry irrigation; increase the area applied integrated crop management measures (ICM), three decreases three increases (3G3T); convert ineffective rice growing models to rice - shrimp and rice - rice models to upland rice models; reducing the rate of burning straw from 90% to below 30%; improved diets for tens of thousands of dairy cows; collection and treatment of millions of tons of organic waste in livestock to make organic fertilizer; applying water-saving irrigation technology for hundreds of hectares of coffee.

In the LULUCF sector, Vietnam has proactively made many efforts to reduce emissions, especially within the framework of the REDD+ program. In the period 2015-2020, programs and projects on REDD+ focus on improving policy institutions, strengthening capacity, developing technical guidelines (reference emission lines for REDD+, MRV, and benefit sharing mechanism, etc.) and invest in REDD+ actions. Several REDD+ programs have taken into account the potential for reducing emissions and enhancing forest carbon stocks from specific REDD+ activities. In 2019, the forest coverage area reached to 41.89% of the total contry surface.

In the Waste sector, many solid waste treatment plants are invested to build and put into operation using new technologies in waste treatment and in conjunction with fertilizer production, which contribute to minimizing waste that must be buried and limit the impact on the environment.

2.3.1.3. Review related policy, actions

National GHG emissions mitigation measures under business as usual (BAU) scenario for the period 2021-2030 were identified for the Energy, Agriculture, LULUCF, Waste and Industrial Processes and Product Use (IPPU) sectors. Contribution to GHG emission mitigation is determined in two cases by national self-implementation and international support through bilateral, multilateral cooperation and implementation of new mechanisms under the Paris Agreement.

The bases for selection of GHG emission reduction measures include: (i) cost/benefit efficiency; (ii) feasible in implementation; (iii) harmonization and co-benefits with climate change adaptation, socio-economic development; and (iv) compliance with national and sector development plans for the period 2021-2030.

According to Vietnam Updated First NDC report in 2020, with domestic resources, by 2030, Vietnam will reduce its total GHG emissions by 9% compared to the national BAU, equivalent to 83.9 million tons of CO_2eq. The estimated GHG emissions mitigation in the energy sector is 51.5 million tons of CO_2eq, accounting for 5.5% of the national BAU; the agricultural sector was 6.8 million tons of CO_2eq, accounting for 0.7% of the national BAU; LULUCF sector was 9.3 million tons of CO_2eq, accounting for 1.0% of the national BAU; Waste sector was 9.1 million tons of CO_2eq, accounting for 1.0% of the national BAU; IPPU sector was 7.2 million tonnes of CO_2eq, accounting for 0.8% of the national BAU. GHG emission mitigation is estimated in each sector, but during implementation the updated NDC will be adjusted to the actual conditions to ensure the national contribution target.

The above-mentioned 9% contribution could be increased to 27% of the national BAU (equivalent to 250.8 million tons of CO_2eq) when international support is received through bilateral, multilateral cooperation and implementation of mechanisms in the Paris Agreement on climate change. More precisely, we estimated that GHG emission reduction could reach 155.8 million tons of CO_2eq (16.7% of the national BAU) by energy sector; the GHG emission reduction for agricultural sector is 32.6 million tons of CO_2eq, accounting for 3.5% of the national BAU; for LULUCF sector is 21.2 million tons of CO_2eq, accounting for 2.3% of the national BAU; for waste sector is 33.2 million tons CO_2eq, accounting for 3.6% of the national BAU; for IPPU sector is 8.0 million tons of CO_2eq, accounting for 0.9% of the national BAU.

2.3.2. Institutional arrangements for GHG emission mitigation activities

Decision No. 2053/QD-TTg dated October 28, 2016 of the Prime Minister approving the Plan for the implementation of the Paris Agreement outlines the tasks to be continuted to implement for the 2021-2030 period, in which the MRV system is

one of the key tasks. In the Vietnam Updated First NDC report provides the MRV system, it has the following structure.

Organizational structure

The MONRE is the focal point for the National Greenhouse Gas Emission Measurement, Reporting and Verification System.

Ministries: Industry and Trade, Transport, Agriculture and Rural Development, Natural Resources and Environment, and Construction are the leading agencies in charge of building and implementing the system of measuring, reporting and verifying of GHG emissions mitigation.

Relevant ministries and People's Committees of centrally-affiliated cities and provinces are coordinating agencies for implementation in the National Greenhouse Gas Emission Measurement, Reporting and Verification System.

Establishments on the list of those required to conduct GHG inventory in accordance with law and relevant organizations shall measure, report and verify under the guidance of the specialized management ministry (see Figure 14).

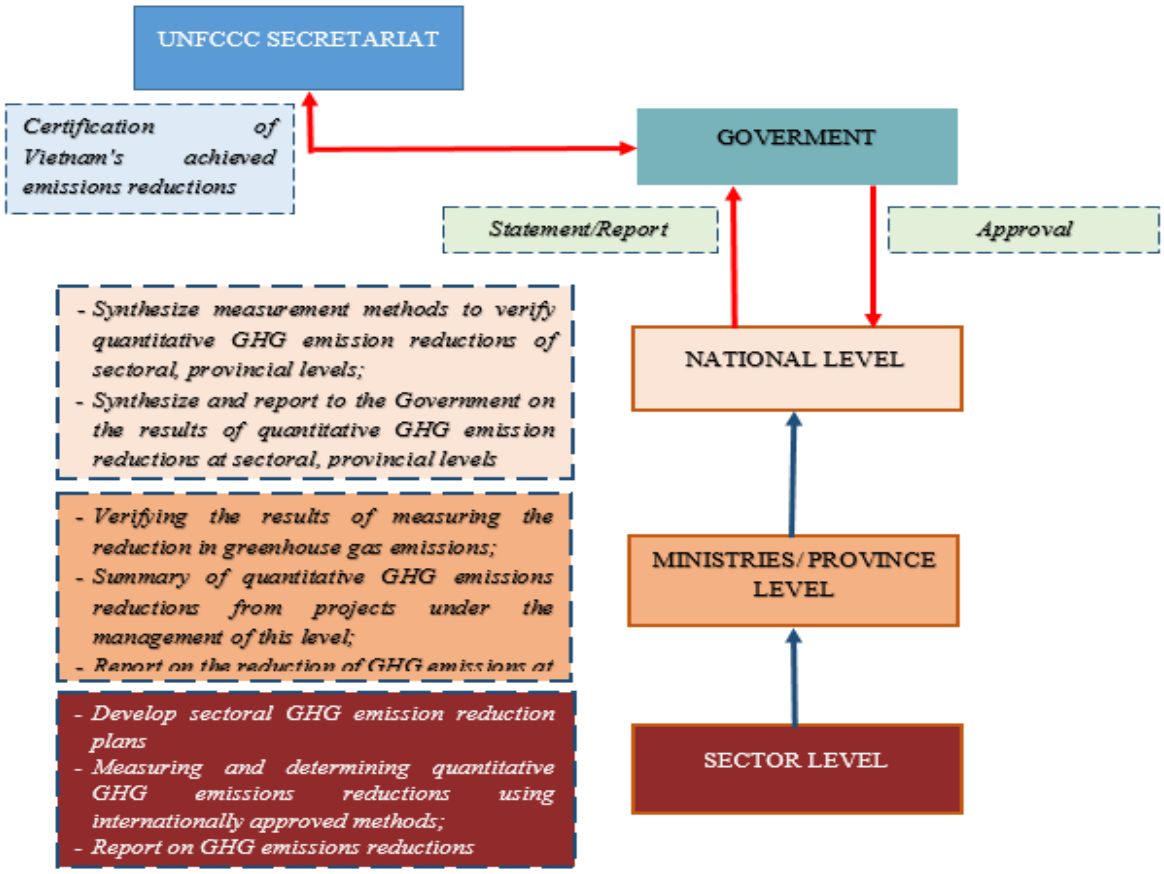


Figure 14: Measurement, reporting and verification (MRV) system for GHG emissions mitigation (Source: NDC, 2020)

The process of implementing the measurement, report and verification system is summarised in Figure 15.

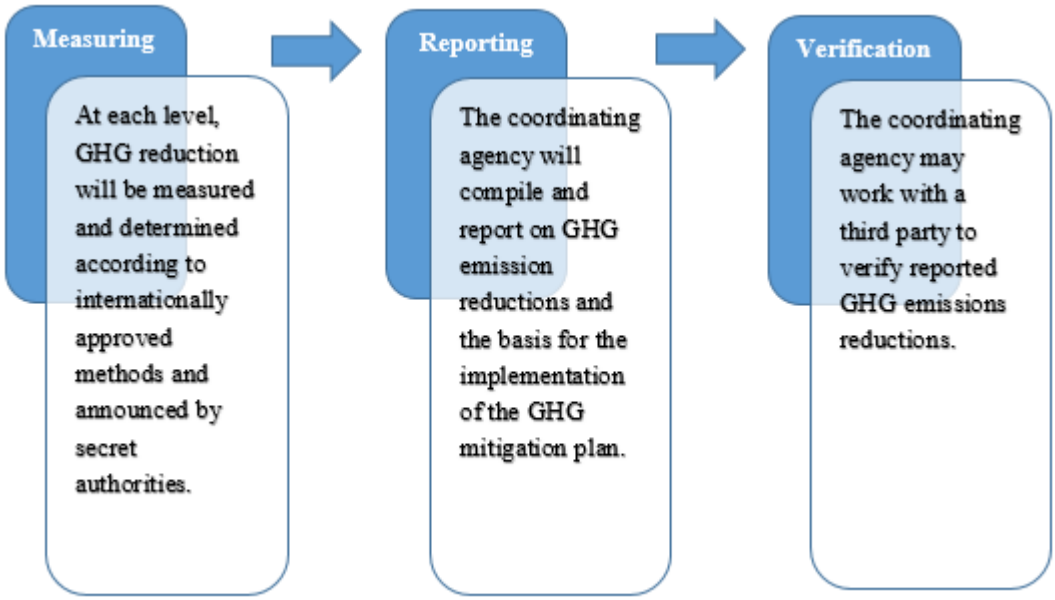


Figure 15: Process of measuring, reporting and verifying GHG emission mitigation activities (Source: NDC, 2020)

2.3.4. Gaps in the MRV system for mitigation actions

Although there have been many efforts in implementing GHG emission mitigation activities, there are still many difficulties and challenges for the MRV system for mitigation activities such as:

- There is no decentralization of management of the MRV system for GHG emission mitigation activities and there is no decentralization between the central and local levels;

- The responsibility has not been linked with powers to ensure the consistency from central to local;

- The system of measurement, reporting and verification (MRV) has not been established at all levels;

- Skilled and technical human resources are still thin.

3. The National Transparency System

3.1. Key components of institutional arrangement

According to Handbook on institutional arrangement to support MRV/transparency of climate action and support of UNFCCC, in some countries, a single organizational structure may be responsible for all themes, objectives and outputs, whereas in other countries these responsibilities may be divided among different independent organizations.

Institutional arrangements can be organized around five separate components (see figure 19). These are:

1. Organizational mandates:
2. Expertise;
3. Data flows;
4. Systems and tools;
5. Stakeholder engagement.

These components include a range of organizations, from government ministries and agencies, to academic and research institutions, to private entities and consultants. Further, developing these components is a process of continual, gradual improvement tracked through a well-developed improvement plan.

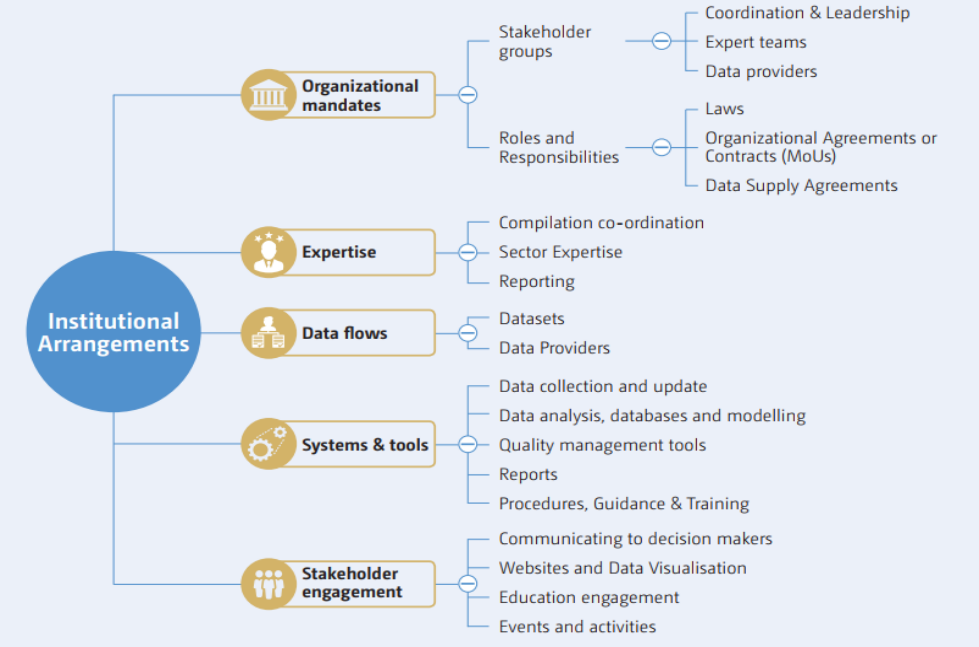


Figure 16: Key components of institutional arrangement

Source: UNFCCC (2020).

The figure above describes the main factors of the institutional arrangements for the national system, but different countries will have their own regulation and characteristics. The institutional arrangements of Vietnam was mentioned in Figure 9, section 2.1.2. Sections 3.2 and 3.3 will propose the institutional arrangements of Vietnam for national inventories and mitigation activities.

3.2. Institutional arrangements for national greenhouse gas inventories to meet reporting requirements under ETF

Basically, Figure 9 shows the full participation of stakeholders and it is the institutional arrangement of the current and proposed national GHG inventory system. The limitation lies in the implementation process. Thus, the national GHG inventory system should have a roadmap to improve the steps taken to fill the gaps, which is showed as follow:

Preparation and implementation

- Need to develop a formal process for preparing/developing national GHG inventory reports, including QA/QC procedures for regular implementation;
- Develop a formal data collection process. Develop a data collection system at the sectoral and provincial/city levels for the complete data collection process.
- Each ministry responsible for data collection should have a specialized officer with competence in GHG inventory.

Data collection requirements

- The legal basis of the national GHG inventory system needs to be improved by introducing a higher regulatory framework such as the Government's Decree on the Roadmap of GHG emission mitigation measures under the Law on Environmental Protection or documents under the Statistics Law, from which relevant ministries can develop guidance for data collection at the sector level;
- Data collected on the General Statistics Office under the Ministry of Planning and Investment should be carefully reviewed and assessed QA/QC on operational data before being sent to MONRE. Supplement work for the technical working groups to assess performance data from the outset.

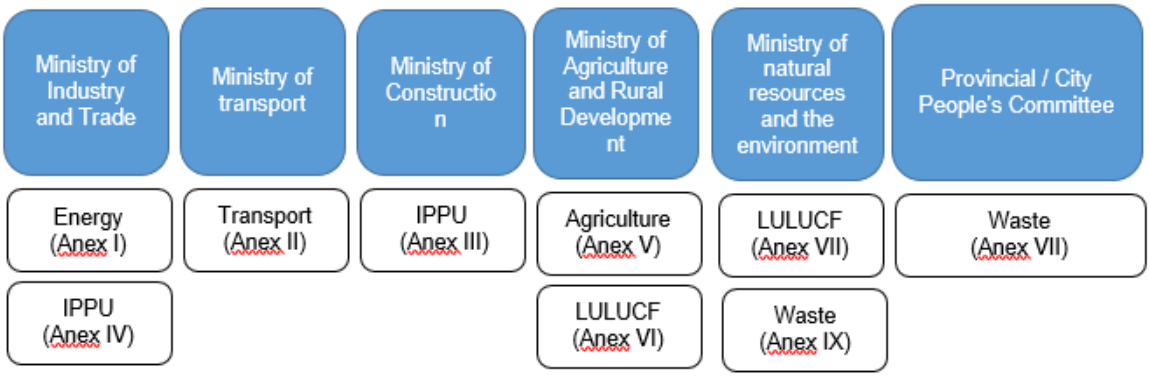


Figure 17: Data collection requirements of different ministries for the national greenhouse gas inventory system

(Source: Own Compilation)

Requirements for inventory

- Improving the capacity of core inventory staff, constantly updating the latest inventory methods.
- Building and expanding an inventory team.
- Using a consistent method and approach for the reported years.
- Conducting inventory according to instructions and performance plan including QA/QC procedures.

Reporting requirements

Based on the elements of Enhanced Transparency Framework for national GHG inventory which shown in section 1.2.1, Table 2 below summarizes the key requirements of the ETF and shows current practice in Vietnam (in BUR3), gaps and recommendation. This helps Vietnam in the development of a detailed roadmap of support needed or in the identification of any changes that may be necessary in term of arrangements (legal, institutional, procedural) resources (human resources and technical expertise, and financial resource) to overcome those gaps for developing and submitting the first BTR in 2024 that satisfies the ETF-requirements.

Table 2: Current status of Vietnam's greenhouse gas inventory system's ability to meet ETF requirements

Reporting factors	Requirement under the ETF	Current practice in Vietnam	Gaps	Recommendations
Methodology, parameters and data	Use 2006 IPCC GL	Used IPCC 2006 guidance for BUR3	None	-
Main category analysis	Propose Tier 3 approach for main categories	Use tiers 1 and 2	The main categories have not applied the tertiary approach	Develop a data collection method for main categories and apply a Tier 3 approach
Consistency and recalculation of time series	Use the same consistent method and approach for baseline performance data and emissions factors for each reported year	Used 2006 IPCC guidance to recalculated for previous inventory years	None	-
	Consistent annual time series starting with the reference year for the NDC	Annual time series not reported	There is no consistent annual time series starting from the reference year	Consistently recalculate/estimate annual time series from the reference year for the NDC
	The most recent reporting year must not exceed two years prior to submission of national GHG inventory reports	The report NC3 published in 2019 with the based year of inventory 2014 (5-year interval)	The time gap is not suitable	Develop a GHG inventory plan and procedure to ensure a gap of no more than 2 years between reporting year and NIR submission year

Reporting factors	Requirement under the ETF	Current practice in Vietnam	Gaps	Recommendations
Evaluate the uncertainty	Uncertainty in estimates of emissions and removals for the reference year for the NDC	Uncertainty assessment was performed in BUR3	None	None
	Trend uncertainty between the year that started and the last reported year	Trend-based uncertainty assessment has been done in BUR3	-	-
Unit of measure	GWP in 100 years from the IPCC's Fifth Assessment Report (AR5)	Has been implemented in BUR3	None	None
Completeness Assessment	Once emissions or removals have been estimated for a category in which they continue to occur, each Country will have to report them on subsequent submissions.	HFCs, PFCs, PCFs and SF6 emissions in Industrial Processes are reported in total in BUR2 - but not in NC3, however it is reported in BUR3	None	None
QA/QC	Develop QA/QC plan for inventory according to the guidance of IPCC	There is no information on plans for QA/QC in NC3 and BUR3	There is no information on plans for QA/QC in NC3 and BUR3	Develop a QA/QC plan for inventory and implement them
	Provides information on QA process for general inventory according to QA/QC plan and IPCC guidance	There is no information on the general QC procedure in NC3 and BUR3	There is no information on the general QC procedure in NC3 and BUR3	Develop a common QC process for inventory and implement them

Reporting factors	Requirement under the ETF	Current practice in Vietnam	Gaps	Recommendations
Sectors and gases	Report at least three gases (CO_2, CH_4, N_2O) as well as any of the four additional gases (HFCs, PFCs, SF_6 and NF_3) included in the country's NDC in accordance with Article 4 of the Paris Agreement. Sector/categories?	BUR3 reports sufficiently on the three required gases and also reports data on HFCs, Nox, NMVOC, CO, SO_2. Sector/categories?	None	None

(Source: South Pole, 2020, Align national GHG emission inventory to support market-based carbon pricing approaches)

Accordingly, the main categories that should be prioritized to apply the Tier 3 approach, along with an institutional approach to doing so, are proposed as follows:

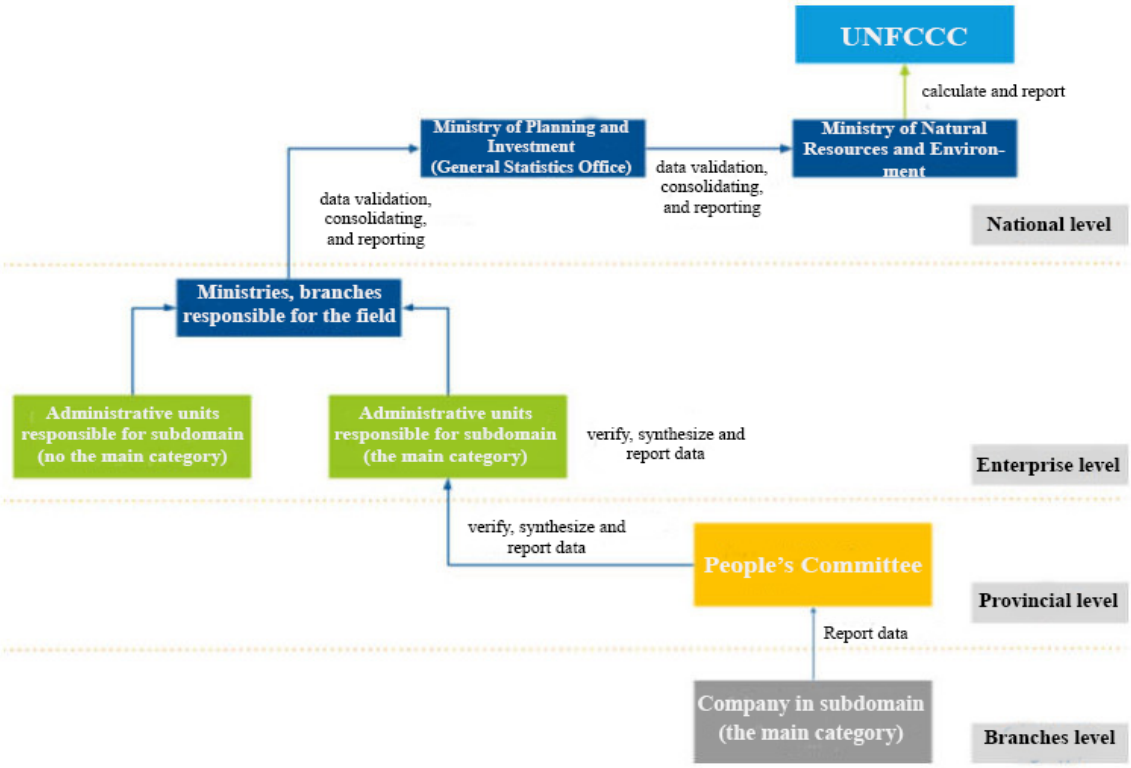


Figure 18: Institutional approach to implementing a Tier 3 approach for key categories of national GHG inventories

(Source: South Pole, 2020, Align national GHG emission inventory to support market-based carbon pricing approaches)

As such, the institutional arrangements in section 2, shown in the Figure 9, is still applied, but the implementation procedures need to be improved to meet the inventory requirements identified in the development of formal procedures for preparing the report as well as in the ETF requirements, which are outlined in Table 2. In addition, gaps related to legal, institutional, procedural and human resources are given with the following remedial measures:

Table 3: Proposal of remedial solutions for national GHG inventory system in accordance with ETF requirements

Gaps	Remedial solutions
Legal basis	
Decision 2359/QD-TTg still applies the revised 1996 GL.	Revise Decision 2359/QD-TTg to accommodate method changes from 1996 revised IPCC GL to 2006 IPCC GL and 2019 Improvement
Decision 2359/QD-TTg does not have sufficient legal basis for ministries to collect data at sectoral and local levels.	Improve the legal basis of the national GHG inventory system by introducing a higher regulatory framework such as a decree, such as a Government Decree on the Roadmap and Measures to reduce GHG emissions under The Law on Environmental Protection, or the document under the Statistics Law, from which relevant ministries can develop guidance for data collection at the sector level.
Decision 2359/QD-TTg does not contain regulations on penalties	Add enforcement terms such as inspecting, urging, collecting data, inspectingparties especially large emission facilities. Handling cases of non-compliance with the proposed Decree.
Data collection	
The current statistical system at the national and sectoral level does not provide enough data needed to meet the requirements of Decision 2359/QD-TTg.	Ministries and branches need to update and complete Circulars and instructions to ensure the collection of necessary data for inventory.
There is no bottom-up approach in data collection to apply a Tier 3 approach to major categories.	Define a bottom-up approach to data collection applying Tier 3 to major categories
There is no QC procedure consistent with the QA/QC plan as directed by the IPCC	The MONRE should develop and apply QC procedures in accordance with the QA/QC plan according to the guidance of IPCC.

Gaps	Remedial solutions
Activity data for GHG inventories are inadequate. There is a lack of a specific database for periodic GHG inventories	Identify a computational methodology to collect data on additional subsectors and additional GHGs and related organizations. Appoint staff in charge and provide additional training to these staff to perform data collection on additional sub-sectors and GHGs in accordance with the 2006 IPCC GL and 2019 Refinement
Limited domestic financial resources and availability of local experts for national GHG inventories	Propose an estimated budget for related improvements that can be afforded by the State budget (e.g. legal/institutional/procedural arrangements, human resources) for MOF to approve Provides additional training on 2006 IPCC Inventory Guides and 2019 2019 Refinement and how to use the IPCC Inventory Software
Most national GHG inventory activities are carried out mainly under programs and projects funded by international donors; The participation of ministries, branches and stakeholders is limited	Strengthen international cooperation to attract financial resources for related improvements that cannot be paid by the State budget (e.g. technical capacity, infrastructure)
There is no data collection tool to collect additional subsectors and additional greenhouse gases (GHGs) as required by IPCC 2006.	MONRE needs to develop a data collection tool to collect additional subsectors and additional GHGs as required by IPCC 2006.

3.3. Proposal for institutional arrangements for MRV of mitigation actions

Vietnam is in the process of submitting the national system for measuring, reporting and verifying GHG emissions to the Prime Minister, with the following key contents:

3.3.1. Requirements for the operation of the MRV system to reduce national greenhouse gas emissions

a) Requirements for measurement activities

- The measurement method is built on the basis of the methodology under the United Nations Framework Convention on Climate Change, in accordance with Vietnam's conditions.

- Measurement activities must be done according to the measurement, reporting and verification procedures, to ensure accuracy, transparency, continuity and consistency of measurement results.

b) Requirements for reporting activities

- The report on measurement results must fully present information about calculation methods, measurement, performance data, applied emission factors, technological solutions, management on GHG emissions reduction and results of GHG emissions mitigation.

- The measurement report must ensure the comprehensiveness, accuracy and transparency of the measurement results on GHG emissions reduction.

- The report on measurement results must be formulated according to the regulations on the form, method and time specified in the measurement, reporting and verification process promulgated by the competent agency.

c) Requirements for verification activities

- The verification of the results of implementing GHG emission reduction measures is carried out by an organization meeting the conditions of capacity, technique and expertise certified by the competent authority.

- Verification activities must ensure publicity and transparency of order, procedures and verification results and comply with the guidance on verification according to the measurement, reporting and verification process issued by the competent authority.

d) Measurement, reporting, and verification procedures shall be promulgated by the competent authority.

3.3.2. Proposal of the organizational structure of national MRV system

The national MRV system for GHG emission mitigation activities has been introduced in BUR3 of Vietnam (section 4.3.1, figure 4.1, page 77) and is summarized as shown below:

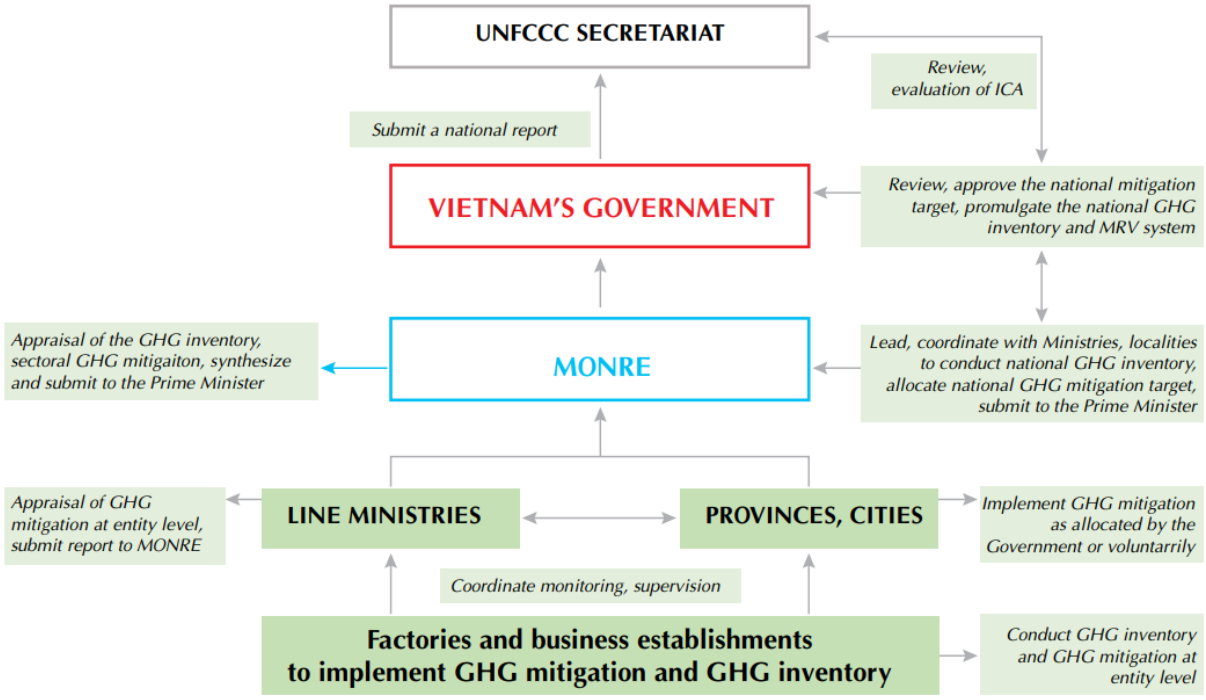


Figure 19: Proposed organisational chart of the MRV system

Roles and responsibilities of relevant agencies and organisations:

- MONRE is the national focal point of the national MRV system.

- MOIT, MOT, MOC, MARD, and MONRE are in charge of developing and implementing the sectoral MRV system under their management.

- Relevant ministries and the People's Committees of provinces and centrally-run cities are coordinating agencies for the implementation of the national MRV system.

- Listed entities are required to conduct GHG inventory as prescribed by the law and relevant organisations are required to conduct MRV as per the guidelines of related ministries.

Figure 19 shows the proposal for the national MRV system. The proposed implementation process for activities, includes Measurement, Reporting and Verification, is shown as follow:

3.3.2.1. Measurement (M)

The measurement process includes:

- Developing process, approval and measurement method;
- Process of implementing quantitative emission reduction measurement

a. *Proposal of a system for building process, approving and measuring method*

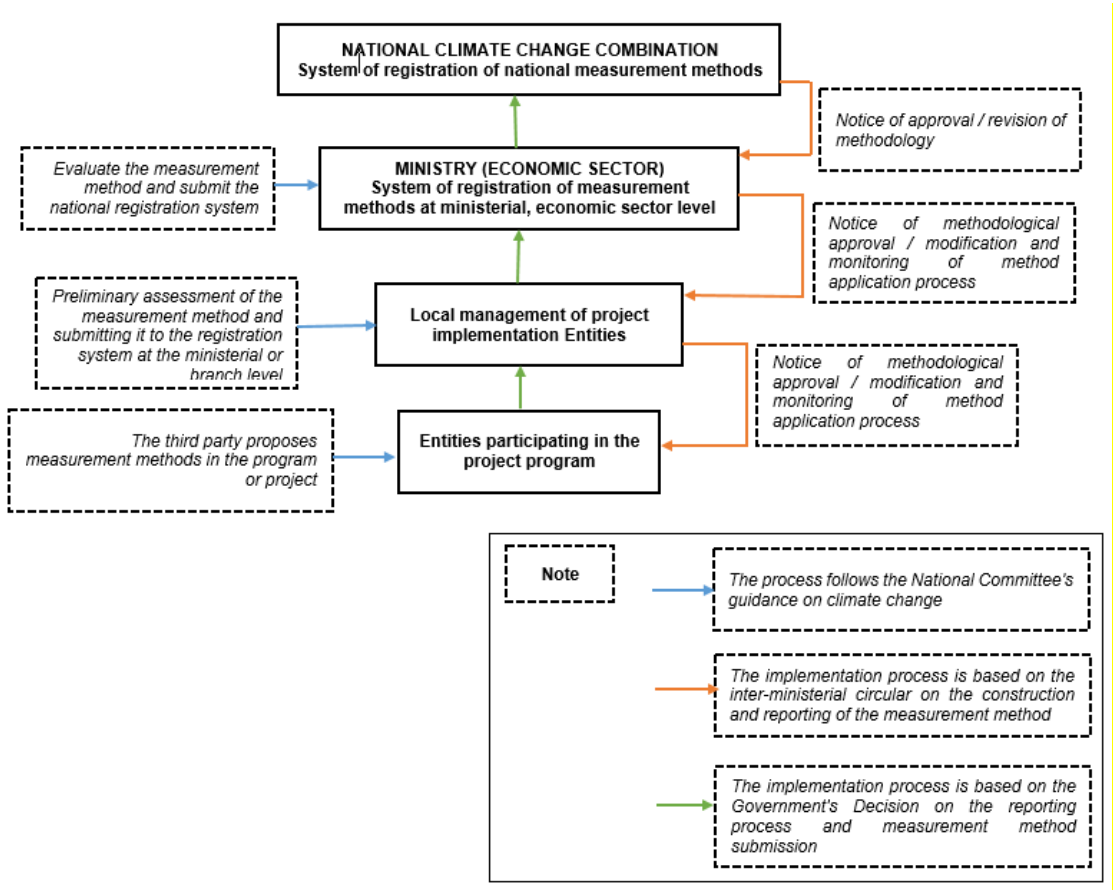


Figure 20: The process of developing and approving measurement methods

Source: Luong Quang Huy (2016).

The subjects involved in the development and approval of measurement methods have the following main roles:

- The participants will propose the measurement plan in the program or project, then submit it to the locality managing the project implementation entities;

- The locality will make a preliminary assessment of the measurement method and submit it to the registration system at the ministerial and sector level.

- Ministries (economic sectors) will evaluate the measurement method and submit it to the National Committee on Climate Change (the national registration system).

- The National Committee on Climate Change will notify the approval or adjustment of the methodology to ministries, localities and finally to project participants.

To perform the measurement process as suggested in Figure 20, the legal requirements for the process of building and approving measurement method include:

1. Decision of the Government on the process of reporting and submitting the measurement method;
2. Inter-Ministerial Circulars on Building and Reporting of Measurement Methods;
3. The National Committee's guidance on climate change develops and approves measurement methods to implement the Government's Decision on the process of reporting and submitting measurement methods.

b. Proposal of implementation process of emission reduction measurement

Measures of quantitative emissions reductions include measuring the types of quantitative GHGs that are reduced or eliminated from project activities on a project's baseline (reference system) or from the economic sector which is developed by the Ministry in charge of the project and it is implemented under the guidance of the National Committee on climate change. Measurement activities are carried out by a third party, to measure the quantitative emission reductions from mitigation project. After that, the results are submitted to the locality managing the project implementation entities. Here, the locality will summarize the quantitative emission reduction of the project and submit it to the data monitoring system at the ministerial and sectoral levels. Emission reductions are assessed by ministries and sectors and submitted to the national data monitoring system, the National Committee on Climate Change afterward. The National Committee on Climate Change has the role and responsibility to monitor the measurement process and the quantitative emission reductions submitted.

To implement the proposed quantitative emission reduction measurement process, the legal requirements for the process of implementing quantitative emission reductions include:

1. Government decisions on procedures for measuring quantitative emission reductions;
2. Inter-ministerial Circulars on the process of measuring quantitative emission reductions;
3. Guidance for the designation, certification, revocation and suspension of third-party certificate for domestic measurement and evaluation activities on the quantitative emission reductions achieved by the project or mitigation program;
4. Guidance of the National Committee on Climate Change on the process of implementing quantitative emission reduction measures to implement the

Decision of the Government and Inter-Ministerial Circulars on the process of reporting and submitting measurement methods.

3.3.2.2. Reporting (R)

The reporting process includes:

- Report on design, project document;

- Report on project mitigation activities

a. Proposal of process for reporting on design, project document

The report on design, project documents will be fomulated depending on the nature of the investment capital for mitigation projects and programs. For example, projects, using Official Development Assistance (ODA) and donor concessional loans, will have to develop, implement a verification process and report on Project plan/outline, document according to Decree 38/2013/ND-CP issued by the Prime Minister on April 23, 2013 on management and use of ODA and donor concessional loans. For projects and programs of investment using foreign direct investment (FDI), units and organizations must prepare their investment project documents according to the Law on Foreign Investment in Vietnam; Law amending and supplementing a number of articles of the Law on Foreign Investment in Vietnam issued on June 9, 2000; and Decrees 24/2000/ND-CP detailing the implementation of the Law on Foreign Investment in Vietnam and Decree 27/2003/ND-CP amending and supplementing a number of articles of Decree No. 24/2000/ND-CP issued on 31 July 2000 details the implementation of the Law on Foreign Investment in Vietnam.

The process of making design reports, project documents and project activities is as follows:

- Subjects participating in the implementation of the project/program will develop and design project documents in accordance with relevant legal regulations and guidelines of the National Committee on Climate Change and then submit them to the locality managing the project implementation entities.
- The locality approves the contents related to licensing implementation/ investment, and submits it to the registration system for mitigation projects at ministerial and economic sector levels.
- Ministries and economic sectors approve the project's contents on mitigation of GHG emission/removals and submit it to the national system of mitigation project registration.

- The National Committee on Climate Change will announce the project design and documents.

To implement the reporting process, project documents, and project activities, the legal requirements of process for reporting on design, project document and quantitative emission reduction activities include:

- Decision of the Government on the process of reporting, submitting designs, project documents for GHG emission or removal reduction;
- Inter-ministerial circular on the process of reporting, submitting designs, project documents for GHG emission or removal reduction;
- Guidelines of the National Committee on Climate Change on reporting and submission of designs and project documents for GHG emission or removal reduction to implement Government Decision and Inter-Ministerial Circular on the process of reporting and submitting measurement methods.

The necessary legal provisions mentioned above can be integrated with the legal provisions on the process of verification and approval of measurement methods and the legal regulations on the actual measurement process of GHG emissions or removals of related projects and programs.

b. Process of reporting on mitigation activities

Regulations on monitoring, inspection and evaluation of projects and programs to mitigate emissions or removal GHGs are generally specified in Decree No. 113/2009/ND-CP issued on 15 December 2009 and Decree No. 38/2013/ND-CP issued by the Prime Minister on April 23, 2013 on the management and use of ODA and donor concessional loans.

The procedures are as follows:

- Subjects participating in the implementation of programs/projects will make reports on mitigation activities according to the guidance of the National Committee on Climate Change and then submit them to the localities managing project implementation entities;
- The localities will approve mitigation activities according to the guidance of the National Committee on Climate Change and submit them to the registration system for mitigation projects at ministerial and economic sector levels;
- Ministries and economic sectors shall approve mitigation activities according to the guidance of the National Committee on Climate Change and submit to the national system of registration of mitigation projects.

- The National Committee on Climate Change will announce the approval and adjustment of mitigation activities.

To perform well the above operating procedures, the legal requirements for the reporting process of mitigation activities include the following documents or mainstreaming content:

1. Government decision on process for reporting on project activities to reduce GHG emissions or removal;
2. Inter-ministerial circular on the process of reporting on project activities to reduce GHGs emissions or removal;
3. Guidelines of the National Committee on Climate Change on the process of reporting the activities of GHG removal or emission reduction projects to implement the Government's Decision and Inter-Ministerial Circular on the process of reporting and submitting measurement method.

3.3.2.3. Verification (V)

The verification process includes:

- Domestic verification/reporting process of quantitative emission reductions achieved;
- International verification/reporting on quantitative emission reductions, achieved by project, sector, country, submitted to the UNFCCC or other international climate mechanisms.

a. National verification/reporting process on quantitative emission reductions achieved by the project

The domestic verification/reporting process of quantitative emission reductions achieved by the project requires the participation of a third party with the national and international certifications. These certifications are required for the verification of quantitative emission reductions achieved by the project, as follows:

Third parties are entities certified by the National Committee on Climate Change as eligible to assess the quantitative emission reductions achieved by the proposed project. Candidates are entities that have submitted an application for designation to the National Committee on Climate Change for third party recognition. The requirement for these candidates is as follow:

- Candidate has to be accredited according to ISO 14065 by an international accreditation body; a member of the International Accreditation Forum (hereinafter "IAF") based on ISO 14.064-2, or
- Candidate is a full-time implementation/assessment agency (DOE) under the Clean Development Mechanism (CDM).

Candidates are designated to undertake a verification of mitigation activities within the areas authorized for verification or designated in accordance with the sectoral scope approved by the National Committee on Climate Change. The sector scope, which is allowed for third-party to verify, is listed and appraised the same as that of the CDM Mechanism.

Candidates should clearly state all scopes of the industry certified for verification in the forms specified by the National Committee on Climate Change. When a third party wishes to be verified in sectors other than the original third-party application, a supplementary application is required and approved by the National Committee on Climate Change.

In addition, the National Committee on Climate Change has the authority to suspend or revoke third-party certification, which will state the reasons for the suspension, revocation and make it publicly available through its website as soon as there is a decision to suspend or revoke. When a third party is suspended or revoked, the third party is responsible for notifying all affected entities, including project participants, to which the third party has contracted to perform measurement or verification of mitigation activities at the time of suspension or revocation.

When a third party is suspended from certification, that third party may resume the verification under the contract in effect at the time of suspension. In case that certification has been revoked, a third party may not continue any verification of mitigation projects.

With the aforementioned characteristics, the legal requirements for the domestic verification/reporting process for the project's quantitative emission reductions include the following documents or mainstreaming content:

1. The Government's decision on the domestic reporting/verification process on the project's quantitative emission reductions;
2. Inter-ministerial circular on domestic reporting/verification of the project's quantified emission reduction;

3. Guidelines for the designation, certification, revocation and suspension of third-party certificate for domestic measurement and verification activities on the quantitative emission reductions achieved by the project or mitigation program.
4. Guidelines of the National Committee on Climate Change on domestic reporting/verification of quantitative emission reductions achieved by the project to implement the Government's Decision and Inter-Ministerial Circular on the process of reporting and submit measurement method.

b. International verification/reporting process of mitigation project, sector, country (R&V) on quantitative emission reductions submitted to the UNFCCC or other international climate mechanisms

After Vietnam's measurement, reporting and verification processes have been finalized, an integrated organizational structure, consulted ministries and agencies and submitted to the Government and the National Assembly for approval on the quantitative emission reduction target of Vietnam and reports on implementation progress should be organized. The results submitted to UNFCCC include assessments and verifications on Vietnam's emission reduction results. The UNFCCC will then certify the emission reductions achieved by Vietnam through mitigation projects and notify the registration system of the National Committee on Climate Change. From there, the proposed emission reduction quota will be notified to ministries, branches and localities. The localities will divide the mandatory and voluntary emission reduction quota among units and projects.

4. Energy and Agriculture

Since 2017, MONRE has worked with ministries, sectors and localities, especially MOIT, MOT, Ministry of Contruction (MOC) and Ministry of Agriculuture and Rural Development (MARD) to develop and implement a number of projects and programmes related to the MRV system at all levels. The above ministries are the leading agencies in the development and implementation of the MRV system for mitigation under their management, guiding the MRV of mitigation results, synthesising the measurement of GHG emission reductions; overseeing and supervising the implementation of sectoral mitigation activities under their management to submit the results to MONRE for synthesising and reporting to the Prime Minister. In order to support the development of MRV systems, several projects and programmes have been implemented to support ministries and sectors in developing legal documents on the MRV system.

4.1. Energy

4.1.1. Institutional arrangements and strengthening linkages on GHG data management and sustainable development impacts in the Energy sector

Pursuant to the Prime Minister's Decision No. 2359/QD-TTg issued on December 22, 2015, the MOIT was assigned to provide operational data including:

- Fuel consumption in the grid-connected Vietnam power plants
- Fuel consumption in self-used power plants
- Fuel combustion consumption in grid-connected non-EVN power generators
- Fuel combustion consumption in iron and steel manufacturing industry
- Fuel combustion consumption in chemical production and petrochemical industries
- Fuel combustion consumption in cement production and building materials industry
- Fuel combustion consumption in the food and tobacco manufacturing industries
- Fuel consumption in leather and textile manufacturing
- Fuel consumption in the pulp, paper and printing industries
- Fuel combustion consumption in other industries
- Fuel combustion consumption in service trade
- Fuel combustion consumption in civil industry
- Fuel combustion consumption in agriculture
- Fuel consumption in the forestry sector
- Fuel combustion consumption in the fisheries sector
- Used as raw materials in production
- Coal mining output
- Oil and gas exploitation output
- Production of finished gas in gas treatment plants
- Acid production, nitrogen compounds and some other substances
- Production and use of soda (Na_2CO_3)
- Production of cast iron, steel and iron-containing alloys
- Production of Aluminum, Magnesium and use of Sulfur Hexafluoride

- National production of goods

On the basis of the methodology for the calculation of GHG emissions presented in Sections 2 and 3 of this report, these active data collected by sector will only meet the requirement for level GHG inventories on national level, but there is no clear definition of GHG emissions for each specific industry or sector. Therefore, if the Industry and Trade sector only focuses on collecting operational data that meets the requirements of Decision 2359/QD-TTg on Vietnam's National Greenhouse Gas Inventory System, it will not obtain data and calculations on GHG emissions by sectors and fields of Industry and Trade. Hence, it is required that the MOIT, the Industry and Trade sector have to develop a system of GHG inventory of the sector, and at the same time meet the data requiment for the current state of GHG emissions for each specific field of Industry and Trade sector and provide highly reliable operation data to the General Statistics Office, serving the calculation of the Vietnam National Economic Zone in accordance with Decision 2359.

4.1.2. Track the progress of implementing nationally-determined contributions in the Energy sector

One of the essential aspects of the MRV activity is “Monitoring of steps to implement planned mitigation actions” and it is also Monitoring the progress of implementation of NDC. The national MRV system will be located at the national focal point for climate change, which is directly related to international report. As for ministries and sectors, depending on the size and extent of GHG emission reduction actions in their management areas, they build specialized MRV divisions for specific activities to simultaneously directs GHG mitigation activities in their own sector and provides reporting information to the national level. GHG emissions from Energy sector are mainly from the consumption of fuels from industrial and transportation activities. Therefore, for mitigation actions in the energy sector, the planning and monitoring of the implementation are focused on the two main ministries/sectors, which are the MOIT and the Ministry of Transport.

In the energy sector, options for economical and efficient use of energy have achieved a reduction in emissions of about 7.3 million tons CO_2eq in 2014 compared to the previous BAU. In 2014, electricity loss decreased by 1.55% compared to 2010, equivalent to about 2.2 billion kWh, thereby reducing emissions by about 1.46 million tons of CO_2eq. In the period 2015 - 2019, electricity loss decreased compared to 2010, equivalent to about 29.7 billion kWh, contributing to reducing emissions by about 26.5 million tons of CO_2eq. Regarding the development of renewable energy by the end of 2019, the total capacity of small hydroelectricity will reach 3,674 MW; wind power is 377 MW; biomass power reaches 325 MW; solar power reached 4,696 MW.

In the transport sector, climate change response is integrated in the process of updating, adjusting and formulating sector strategies and plans. The use of renewable energy in public lighting and traffic signals is also enhanced.

4.1.3. Proposal for GHG data management and monitoring of implementation of GHG emissions mitigation actions in the energy sector

The energy sector is the one that is expected to provide 5.5% of the projected GHG emissions reductions (51.5 million tons CO_2eq) by 2030 in case of self-implementation by the country, and 11.2% of the GHG emission reductions (104.3 million tons CO_2eq) is expected by 2030 in case of having international support. To archive these above targets, institutional arrangment as following:

MOIT: Responsible for formulating and implementing policies, plans, and regulations in the sectors of industry and trade. The MOIT is responsible for the formulation, implementation and oversight of national energy development strategies under the management of the MOIT.

The Department of Energy Saving and Sustainable Development, the MOIT is responsible for allocating resources, developing plans, implementing the system of GHG inventory, synthesizing and storing data, and reporting in accordance with regulations when required. In addition, in the implementation process, if there are any problems or difficulties that need to be resolved, it is necessary to proactively propose measures to improve the situation as well as ensure the quality of data sources and inventory results, as well as improving inventory results in the next times.

Proposed model/system for providing and managing data on GHG inventory in the Energy sector is shown in Figure 21 based on its current status of data sourses, system of databases, functions and tasks of units and enterprises, as following:

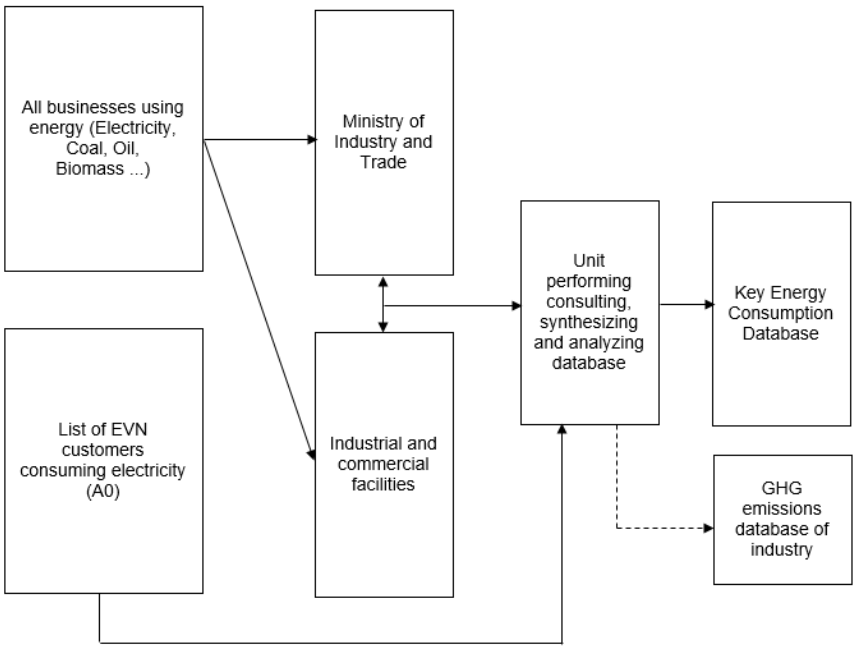


Figure 21: Model of providing and managing data on GHG inventory in the energy sector

(Source: Nguyen Quang Huy, 2018)

- Solid lines describe the collection of energy consumption data (including electricity, coal, oil, gas and biomass) of key energy consuming enterprises in accordance with existing regulations. The report on the situation of energy use is carried out by enterprises and sent simultaneously to the Ministry and the Department of Industry and Trade. Base on these two data storage locations, the MOIT will assign an affiliated consulting unit to review, correct and complete the database on energy consumption of enterprises across the country for the whole country.

- Base on the database on energy consumption formed according to the requirements of Circular 09/2012/TT-BCT, the consulting unit can use the database on electricity consumption of customers from the Power Dispatch Center. country (A0) to best calibrate the data. The product of this process is a list of key energy consuming facilities with total energy consumption converted into TOE equivalent to consumption of over 1000 TOE/year.

The MRV's goal of climate action in the energy sector is to improve the transparency of climate action and enable the Government of Vietnam to understand and report on the energy sector's contribution to national goals on climate change, including Vietnam's NDC. The MRV allows the Government of Vietnam to meet its legal obligations to measure, monitor and report on climate change actions. The MRV system will track progress toward the Vietnam's mitigation and adaptation goals and the NDC; improving

climate understanding and sustainable development results of mitigation actions; provide information on assistance received in the context of climate change actions; contribute to improving domestic and international reporting.

The establishment of an MRV system in the energy sector should be based on existing work and integrate with established institutional processes for developing GHG inventories, including: GHG inventory process is the basis of MRV in the energy sector, and there is no need for a separate MRV structure or system. The data collection and reporting system for GHG inventories is the foundation for planning and decision-making on energy sector mitigation actions, including those to achieve Vietnam's NDC. Information data on sustainable development impacts of mitigation actions should also be integrated in MRV activities after assessing emission reductions of each task or project and aggregated in each sector.

Based on the requirement of the task to provide operational data for the national GHG inventory in Decision 2359/QD-TTg on implementing the requirement of controlling GHG emissions of the industry and trade sectors, and based on the functions and tasks of sector management of units under the MOIT, it is possible to consider, assign, organize and implement the sector's GHG inventory as follows:

The Institute of Energy collects data and builds a database for specific operational fuel consumption activities data as follows:

- Grid-connected power plants of Vietnam Electricity (EVN),
- Self-used power plants
- External power generation machines grid -connected EVN
- Iron and steel industry
- Chemical and petrochemical industries
- Cement production industry cement and construction materials
- Food and tobacco manufacturing industries
- Leather and textile manufacturing
- Manufacturing industry paper, pulp and printing
- Other industries
- Service trade
- Civil industry

- List of all coal, gas and hydroelectric power plants.

The database ensures enough information includin: Fuel consumption of each plant.

- Frequency of annual inventory, in addition, it is necessary to have information about the factory: Name, Address, Coordinates, Company installed capacity, the amount of electricity produced in the year.

Petroleum and Coal Department is responsible for data collection for:

- Coal mining

- Oil and gas exploitation output

- Production of finished gas in gas treatment plants

Data source: From VINACOMIN, PVN, Statistical Yearbook. The database ensures enough information including: list of all factories, annual inventory frequency, proposing a monitoring model to implement GHG emission reduction actions in the energy sector.

The Department of Energy Saving and Sustainable Development is responsible for allocating resources, developing plans and implementing the system of GHG inventory, synthesizing and storing data, and reporting in accordance with regulations when required.

Proposing a monitoring model to implement GHG emission reduction actions in the energy sector is shown in Figure 22.

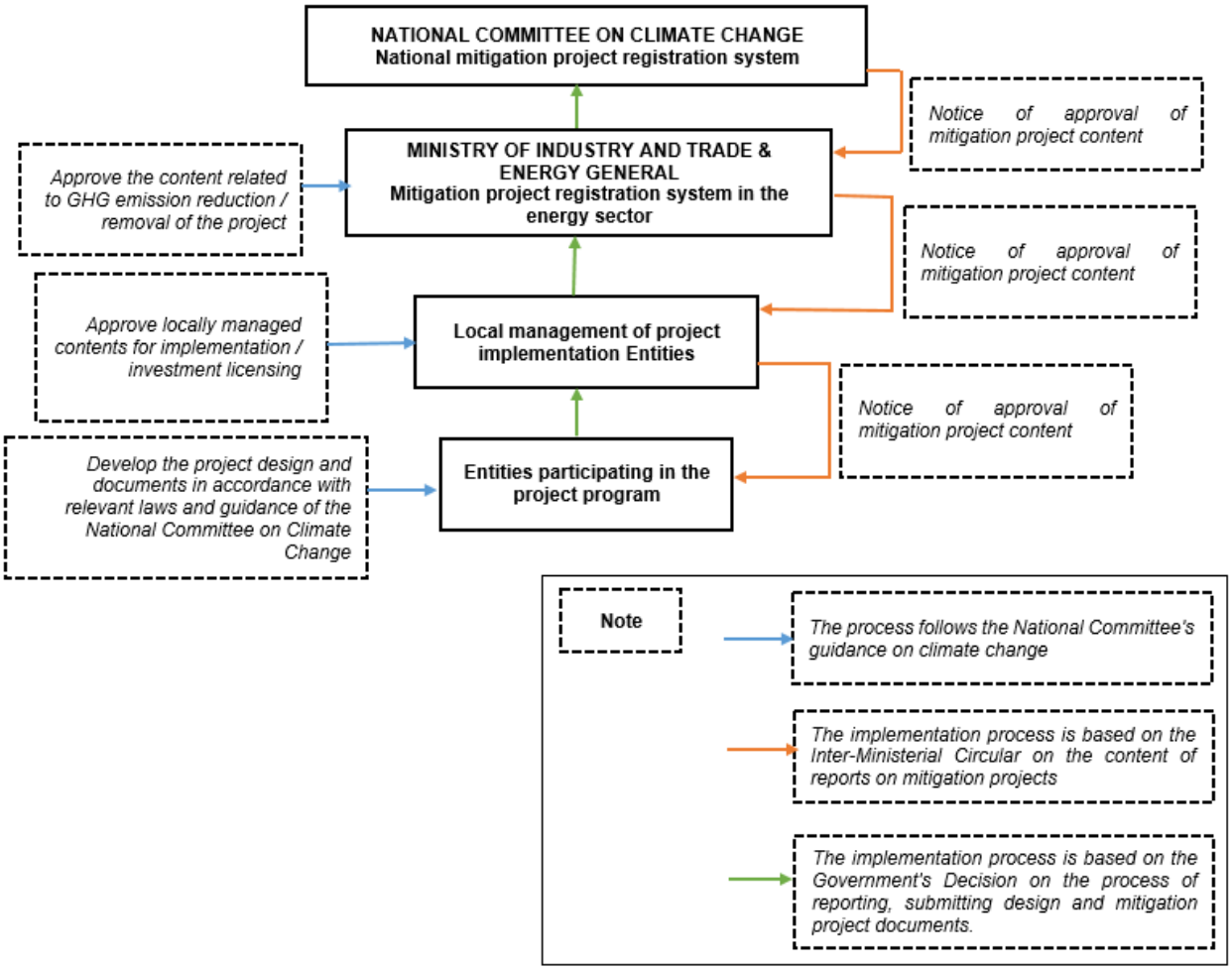


Figure 22: Monitoring model for implementing GHG emissions mitigation actions in the Energy sector

(Source: Luong Quang Huy, 2016)

According to the monitoring model, the implementation of GHG emission mitigation actions in the Energy sector above can be divided into stages:

For the process of developing and approving the methods and the process of measuring the reduction of GHG emissions, it is necessary to follow below steps:

- Entities participating in emission reduction programs and projects in the Energy sector are responsible for hiring a third party to propose that method in the program or project to the local management agency.

- The localities managing the project implementers must make a preliminary assessment of the measurement method and submit the registration system to the MOIT,

then notify approval or adjust the methodology and monitoring of the application of the method

- The MOIT is responsible for evaluating the measurement method and submitting it to the national registration system and then notifying the approval or adjustment of the methodology and monitoring the application of the method.

- The National Committee on Climate Change will notify about the approval or the adjustment of the methodology.

For the process of measuring the reduction of GHG emission, the following steps should be followed:

- A qualified third party will perform quantitative emission reduction measurements by coporating with the subjects participating in the programs and projects.

- The localities managing the project implementers must monitor the process of measuring the quantitative emission reductions and summarizing the quantitative emission reductions of the project and submit them to the data monitoring system of the MOIT.

- The MOIT is responsible for monitoring the process of measuring the quantitative emission reductions and synthesizing the quantitative emission reductions of the project ; and submitting them to the national data monitoring system.

- The National Committee on Climate Change will oversee the process of measuring quantitative emission reductions.

For the reporting on design, the project document should follow the following steps:

- Entities participating in emission reduction programs and projects in the energy sector are responsible for developing project designs and documents in accordance with relevant laws and regulations and under the guidance of the National Committee on Climate Change to the local management agency.

- The localities that manage the project implementers must approve the contents managed by the locality for the licensing of project/investment implementation and then notify the design and project documents.

- The MOIT is responsible for approving the contents of the project on GHG emission reduction and then announcing the project design and documents.

- The National Committee on Climate Change is responsible for approving the contents of the project on mitigation of GHG emissions and then announcing the project design and documents.

For the process of monitoring, testing and evaluating, the following steps should be followed:

- Entities participating in emission reduction programs and projects in the Energy sector are responsible for making reports on mitigation activities according to the guidance of the National Committee on Climate Change.

- The localities managing the project implementers are responsible for approving the mitigation action report according to the guidance of the National Committee on Climate Change and then notify the approval or adjustment of the mitigation activities.

- The MOIT is responsible for approving the mitigation action report according to the guidance of the National Committee on Climate Change and then announcing the approval or adjustment of the mitigation activities.

- The National Committee on Climate Change are responsible for approving or regulating mitigation activities.

4.2. Agriculture

4.2.1. Institutional arrangements and strengthening linkages on GHG data management and sustainable development impacts in the Agriculture sector

Pursuant to the Prime Minister's Decision No. 2359/QD-TTg issued on December 22, 2015, the Ministry of Agriculture is assigned to provide operational data including:

Feed digestion sub-sector: Number of cattle and poultry by province/city.

Agricultural waste management sub-sector: Ratio of livestock waste treatment by region.

Rice sub-sector: The cultivated area of spring rice

Rice sub-sector: The cultivated area of autumn rice

Rice sub-sector: The cultivated area of winter rice

Sub-sector Agricultural land: Crop production by province/city.

Burning grassland: The area of burned grassland and shrub land.

According to Decision No. 841/QD-BNN-KHCN issued on March 16, 2016 of the Minister of Agriculture and Rural Development assigning tasks to agencies to implement

Decision No. 2359/QD-Ttg issued on December 22, 2016 2015 of the Prime Minister as follows:

The Department of Science, Technology and Environment is responsible for:

- Guide on general management of GHG inventory results of the Ministry of Agriculture and Rural Development.

- Develop plans and organize the implementation of capacity building on GHG inventory and GHG monitoring of MARD.

- Being the focal point to coordinate with ministries and branches in GHG inventory.

The Department of Livestock Production is responsible for:

- Collect and provide activity data and related information for GHG inventory in the sub-sector of food digestion and agricultural waste management. Specifically:

- Number of cattle and poultry by province/city.

- Ratio of animal husbandry waste treatment by region.

The Department of Crop Production is responsible for:

- Collect and provide operational data and related information for GHG inventory. Specifically:

+ The cultivated area of spring rice

+ The cultivated area of autumn rice

+ The cultivated area of winter rice

+ Crop production by province/city.

+ The area of burned grassland and shrub land.

4.2.2. Process tracking of implementing NDCs in the Agriculture sector

The MRV process plays a key role in ensuring smooth data flow, strengthening GHG data management and sharing among stakeholders so that mitigation efforts can be tracked and efficiency improved.

Decision No. 891/QD-BNN-KHC issued on March 17, 2020 of the Minister of Agriculture and Rural Development approved the implementation plan of the Paris Agreement on climate change of the Ministry of Agriculture and Rural Development in the period of 2021-2030, in which the mandate is “Establishment of MRV System for sector-level GHG emission reduction activities in the agricultural sector” and the priority task is

“Implementation of GHG emission reduction of the Agriculture and Rural Development sector in order to implement NDC”.

The focal point which is the Department of Science, Technology and Environment is responsible for observing, urging, monitoring, evaluating and synthesizing reports on the implementation of the Paris Agreement Implementation Plan of the Ministry of Agriculture and Rural Development in 2021-2030 period, coordinating with relevant agencies to develop Measurement, Reporting and Verification (MRV) guidelines for sub-sectors and fields.

4.1.3. Proposing on GHG data management and monitoring implementation of GHG emissions mitigation actions in the Agriculture sector

For the Ministry of Agriculture and Rural Development, it is necessary to develop specialized MRV divisions for specific activities with the following minimum requirements:

- Establish a specialized unit responsible for coordinating MRV activities for emission reduction or enhancement of GHG removal in the area under the management of MARD.

- Develop mechanisms for coordination among sector agencies in providing information and reporting, and mechanisms for coordinatiing and monitoring from specialized agencies.

- Appoint qualified staff in charge of specific areas of expertise,

- Develop sector-specific domestic MRV systems according to the principles recommended by the UNFCCC: make the most of existing methods, systems and information, and consider developing new systems and methods appropriately.

- Allocate budget to maintain the operation of the coordinating unit at the focal point of ministries and branches as well as budget for specialized consultancy activities when necessary.

- Generate general guidance documents as the basis for the development of domestic MRV systems for each specific sector.

Proposed model of providing, managing data on GHG inventory and monitoring mitigation activities in the Agriculture sector as follows:

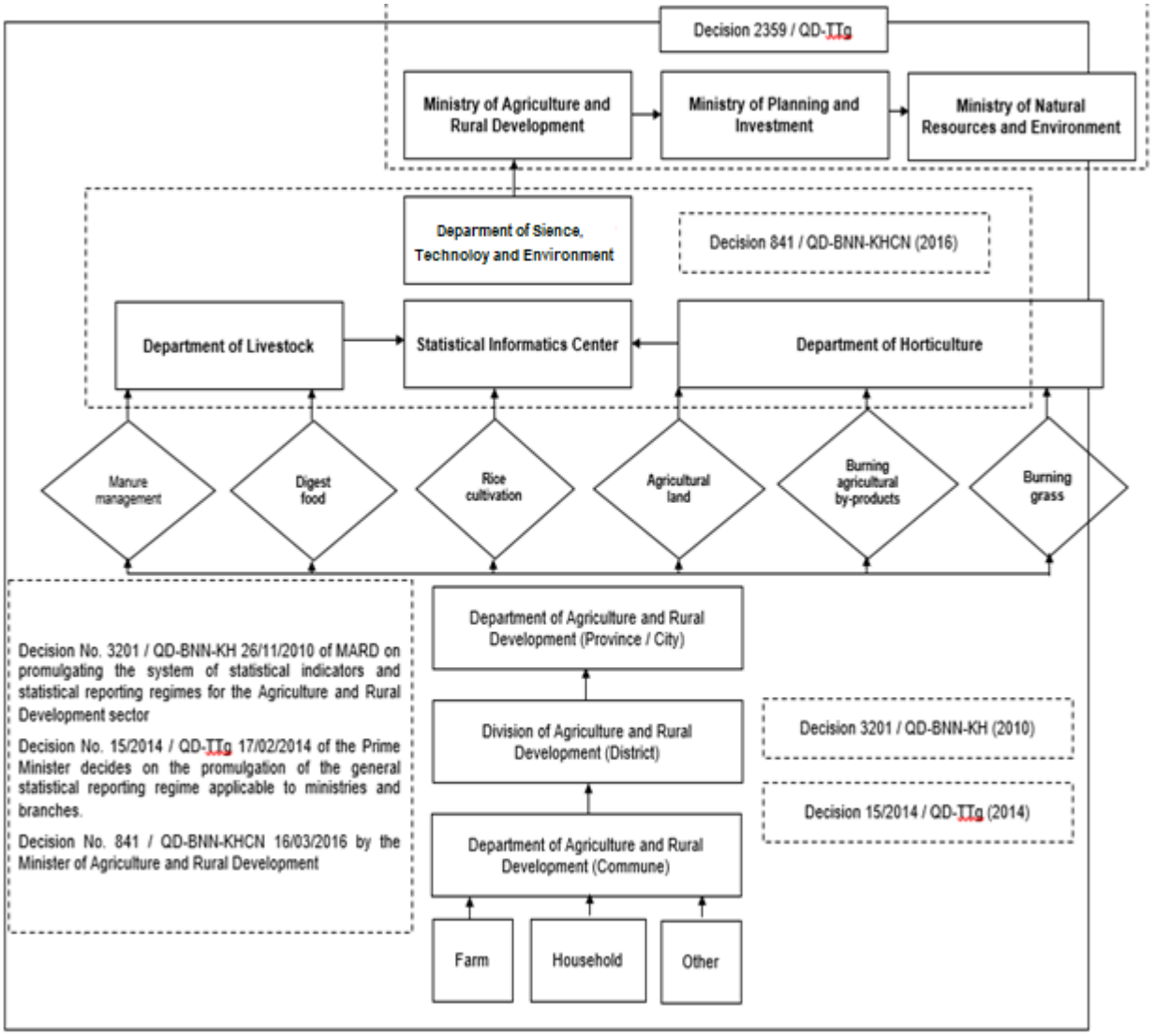


Figure 23: Model of providing and managing data on GHG inventory in the Agriculture sector

(Source: Ricardo Energy & Environment, 2017)

According to the proposed model, the Ministry of Agriculture and Rural Development is primarily responsible for the management and collection of information on GHG inventories in the Agriculture sector.

The Department of Science, Technology and Environment is the focal point of the Ministry to synthesize, process and report to the Ministry's leaders on information on GHG inventory.

The Department of Crop Production, Department of Livestock Production and the Information and Statistics Center are responsible for compiling key performance metrics in areas such as Livestock, Crop production and other relevant metrics.

According to the proposed model, the Department of Natural Resources and Environment, the Division of Natural Resources and Environment of the district and commune are responsible for collecting information on livestock and crop production of each district and commune, then summarizing and reporting. to the district and province.

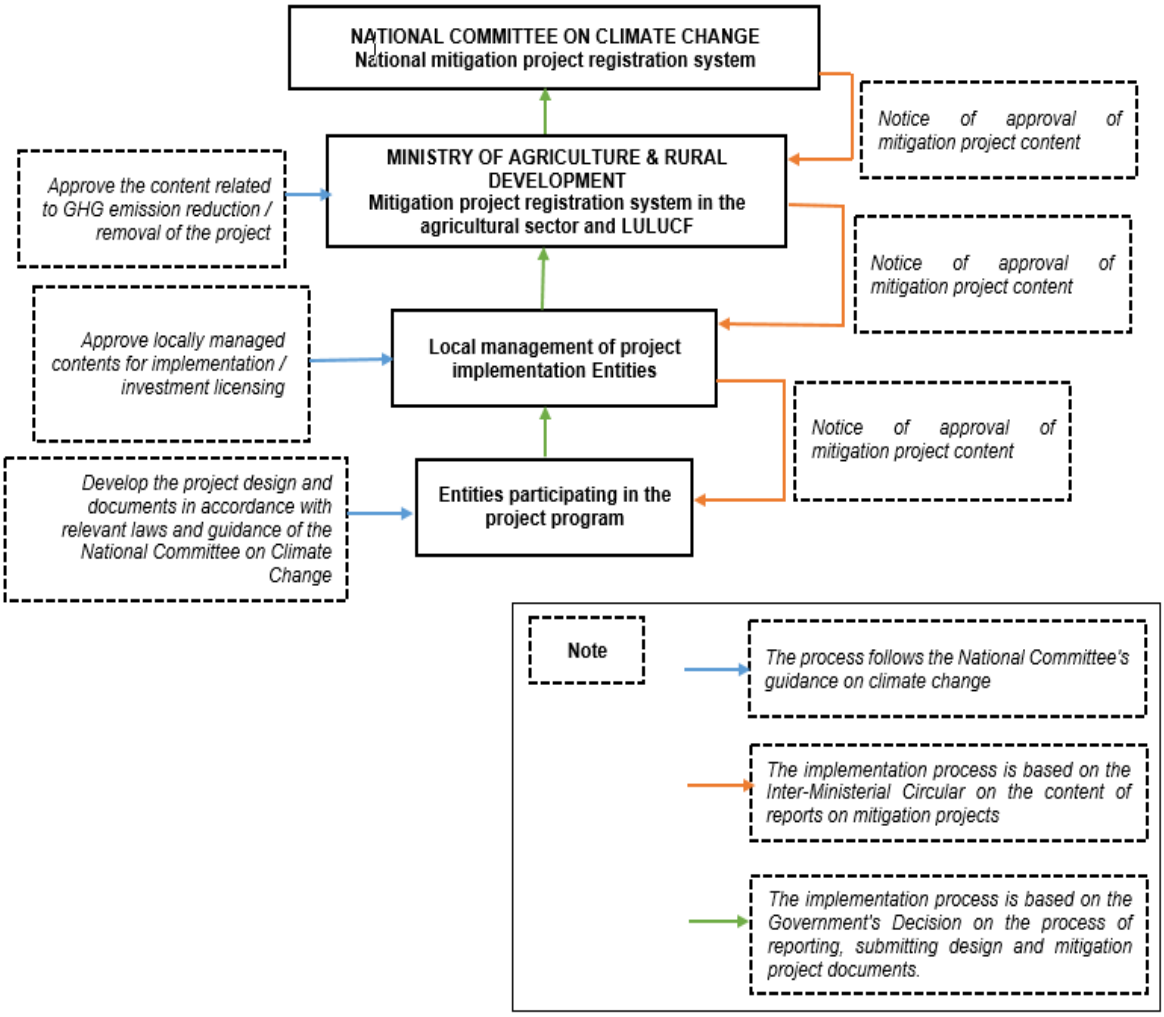


Figure 24: Monitoring model for implementing GHG emission reduction actions in Agriculture sector

(Source: Luong Quang Huy, 2016)

In Figure 24, the monitoring model for the implementation of mitigation actions for GHG emissions in the Agriculture sector is similar to that in the Energy sector above and includes: The process of developing and approving measuring methods and implementation process of measuring the reduction of GHG emissions; The process of measuring GHG emission reduction; Process of reporting on design and project documents; The process of monitoring, testing and evaluating.

5. Recommendations and a plan/roadmap for actions to further develop the institutional arrangements to be 'ETF-ready' by 2024

As discussed in sections 3 and 4 of this report, Vietnam's institutional arrangements for the GHG inventory system and the MRV system for mitigation actions are still inadequate:

- Institutional arrangements for national GHG inventories have been proposed and implemented throughout the inventory cycles, but the implementation process and implementation steps in the institutional arrangements are still having gaps that needs to be filled. The gaps are mainly related to the development and preparation of the national GHG inventory implementation plan; method of data collection; data availability and stakeholders' responsibility for data development and collection.

- Institutional arrangements for MRV the GHG emission reduction activities have also been proposed to the Prime Minister and will serve as a basis for readiness for national NDC monitoring activities.

- To meet the requirements of the Enhanced Transparency Framework under the Paris Agreement, in Vietnam, a plan is currently needed to prepare the country to be “ETF ready”, also to facilitate the transition from BURs to BTRs. Thus, it is necessary to have a thorough review from the preparation stage, to assigning roles to relevant ministries and agencies through the process of institutional arrangement into a national system.

- To ready for transition from BUR to BTR, the following steps are recommened such:

From now

+ Research requirement for BTR reporting and enhanced transparency framework;

+ Improve domestic institutions and policies;

+ Develop formal process for preparing inventory report including QA/QC procedures;

+ Develop a formal process of data collection to prepare GHG emissions for the next study;

+ Training on IPCC2006.

In 2022:

+ Use Guideline IPCC 2006 for the next NC;

+ Finalize institutional arrangement for GHG inventories;

+ Preparing the indicator(s) for NDC tracking;

+ Preparing the data needs for tracking mitigation actions;

In 2023:

+ Set up ETF steering group;

+ Improving the GHG inventory system for BTR ontime;

+ Collecting data of mitigation actions;

+ Capacity building on GHG inventory;

In 2024: Ready for building the first BTR.

CONCLUSIONS

The report has reviewed and assessed the current status of the MRV system for GHG inventory and GHG emission reduction actions to track the progress of the NDC implementation in Vietnam. The transparency system of Energy and Agriculture sector and its MRV systems have shown as examples.

The Vietnam's MRV system has not been officially issued yet, but it is on the way to complete and should be promulgated soon in the next year of 2022. In the context of preparing to develop ETF-ready, to effectively implement national MRV system in Vietnam, it is recommended that capacity buiding or other support needs should be considered based on capacity needs analysis.

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