ICAT Initiative for Climate Action Transparency

Deliverable # 2

Initiative for Climate Action Transparency – ICAT Project in Lesotho

MRV Needs and Gaps Assessment

Initiative for Climate Action Transparency – ICAT

Deliverable #2:

GAPS, BARRIERS AND NEEDS ASSESSMENT

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List of Acronyms

AD- Activity Data

AFOLU- Agriculture, Forestry, and Other Land Use

BAU- Business as Usual

BOS- Bureau of Statistics

BUR- Biennial Update Report

CBO- Community-Based Organisation

CCF- Climate Change Fund

DSM- Demand Side Management

DOE- Department of Energy

ESCF- Energy Sector Coordination Forestry

GACMO- Greenhouse Gas Abatement Model

GHG- Greenhouse Gas

GOL- Government of Lesotho

IPPU- Industrial Process and Product Use

JICA- Japanese International Cooperation Agency

LMS- Lesotho Meteorological Services

M&E- Monitoring and Evaluation

MOFDP- Ministry of Finance and Development Planning

MRV- Monitoring Reporting and Verification

MW- Mega Watt

NC-National Climate Change Committee

NCCAP-National Climate Change Adaptation Plan

NCCP- National Climate Change Policy

NCCPIS- National Climate Change Policy Implementation Strategy

NDC- Nationally Determined Contribution

KW- Kilo Watt

NEC- National Environment Council

NGO- Non-Governmental Organisation

NSDPII- National Strategic Development Plan II

NUL- National University of Lesotho

PA- Paris Agreement

PPP- Public-Private Partnership

PV- Photovoltaic

QA- Quality Assurance

QC- Quality Control

SE4ALL- Sustainable Energy for All

SHERQ- Safety Health Environment, Risk and Quality

SHS- Solar Home System

SNC- Second National Communications

SWH- Solar Water Heater

TED – Technologies for Economic Development

TNC- Third National Communication

UNDP- United Nation Development Programme

UNIDO- United Nation Industrial Development Organisation

UNFCCC- United Nations Framework Convention on Climate Change

UNOPS- United Nations Office for Project Services

VAT- Value Added Tax

1. INTRODUCTION

Lesotho, like other signatories to the UNFCCC, has committed to reducing its greenhouse gas emissions and implementing climate change mitigation and adaptation measures. The BUR Lesotho (2021) recommended the need to formalise institutional arrangements for the monitoring, collection, management and reporting of climate information. This includes information related to the national greenhouse gas inventory, climate actions (for both adaptation and mitigation) and support (financial, technical and capacity building) received and required. Identify gaps and develop costed action plans to remediate gaps. Therefore, this assignment focuses on working on the Measurement, Reporting, and Verification (MRV) gaps, barriers and needs assessment within the context of the United Nations Framework Convention on Climate Change (UNFCCC). MRV is a critical component of international climate agreements, ensuring transparency and accountability in the efforts to address climate change.

The deliverable seeks to identify gaps and needs in the current MRV processes, systems, and capacity of Lesotho according to UNFCCC set standards. This involves evaluating the effectiveness of existing MRV frameworks, identifying areas where improvements are necessary, and assessing the capacity building requirements for countries to fulfil their MRV obligations effectively. By identifying gaps and needs, the assessment will guide efforts to strengthen Lesotho's MRV capabilities and enhance her contribution to global climate interventions.

The key components of the assessment will be reviewing the adequacy of policies, regulations, and legal frameworks supporting MRV activities and compliance with international commitments, assessing the technological infrastructure and tools necessary for data collection, analysis, and reporting, evaluating the availability, accessibility, and quality of data related to greenhouse gas emissions, mitigation actions, and adaptation measures and assessing the capacity of the country in terms of technical expertise, institutional support, and financial resources required for MRV systems.

Two mitigation measures have been selected from the revised Nationally Determined Contribution (NDC) in which the needs and gaps will be analysed: Efficient gasoline car and Solar Home System (SHS).

2. THE PROCESS OF THE MRV SYSTEM

The term Measurement, Reporting, and Verification (MRV) originally came from the Bali Action Plan, the negotiating text of the UNFCCC (2008). The basic understanding of the Bali Action Plan is that climate change mitigation actions mainly reduction of GHG emissions shall be implemented in a "measurable, reportable and verifiable" manner (Singh et al. 2016). Under the Paris Agreement (4th November 2016), all countries are mandated to provide emission data and track progress against their contributions (Carbon Management Journal 2018). Therefore, it is against this backdrop that Lesotho is serving its mandate by the development of MRV systems. The benefit of having MRV management system will be to have a good understanding of a country's GHG profile and reduction possibilities, to track NDC progress and obligations in a transparent manner, to unlock financial opportunities for Lesotho through new and additional channels.

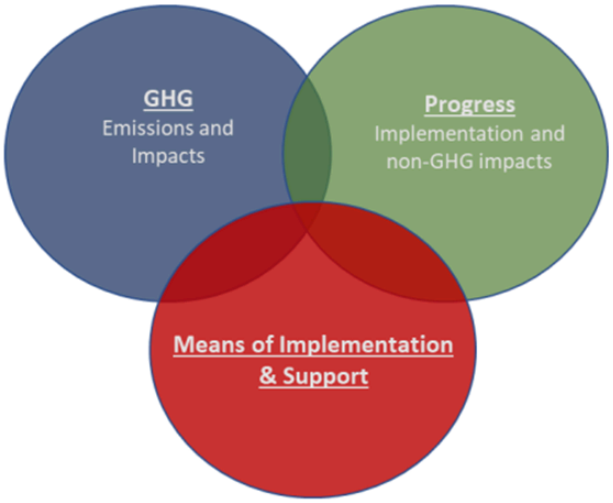
MRV process within the UNFCCC is a framework established to enhance transparency and accountability in the efforts of countries to address climate change. MRV is foundational to global response to climate change and enables countries to meet international reporting requirements such as National Communications, Biennial Update Reports, and National GHG Inventories (ADB 2023). It also enables countries to demonstrate progress under measures such as low emission development strategies, NDCs, and NAMAs. MRV processes provide the information that countries need to inform their broader climate change and sustainable economic development objectives.

Measurement includes quantifying greenhouse gas emissions and removals. It includes establishing baseline emissions levels, monitoring changes over time, and identifying sources of emissions. Measurement involves both direct measurements and estimations based on activity data and emission factors.

Reporting, refers to the process of submitting data and information on greenhouse gas emissions, mitigation actions, and other relevant factors to the UNFCCC Secretariat. Parties to the convention are required to regularly report on their emissions and actions taken to address climate change, as outlined in the reporting guidelines established by the UNFCCC.

Verification involves independent assessment and validation of reported data and information to ensure accuracy, completeness, consistency, and transparency. This may include technical reviews, expert assessments, and onsite inspections conducted by designated bodies or teams of experts. Verification helps to build trust in the integrity of reported emissions data and enhances the credibility of efforts to address climate change.

There are three separate climate related aspects that MRV is carried out on MRV of GHG Emissions and Removals, MRV of Mitigation Actions and MRV of Technical and Financial Support (UNFCCC, Handbook on Measurement, Reporting and Verification for Developing Country Parties, 2014)



Source:MRV Aspects: source UNDP 2021

Figure 1: MRV Aspects

2.1 MRV of GHG Emissions and Sources

MRV of GHG emissions and sources refers to the process of systematically measuring, reporting, and verifying greenhouse gas emissions and their sources. This involves accurately quantifying the amount of greenhouse gases emitted or removed. It requires using various methodologies and tools, such as direct measurements, emission factors, and activity data. It includes collecting data on greenhouse gas emissions from various sources such as energy production, transportation, agriculture, and industry. Monitoring systems can embrace direct measurements, activity data, and emission factors. Countries are required to report their greenhouse gas emissions data regularly to the UNFCCC.

Once the measurements are taken, they need to be reported to relevant stakeholders, such as government and other entities in climate change field. Reporting typically consist of compiling data in a standardized format, often following guidelines set by agreements like the Paris Agreement or any other regulatory bodies like the Intergovernmental Panel on Climate Change (IPCC). Proper reporting entails comprehensive inventories of emissions broken down by sector and gas type. This data helps to assess the GHG contribution and track progress over time.

Verification ensures the accuracy and reliability of reported data. Independent verification processes may be conducted by third party auditors or governmental agencies to confirm that reported emissions/removals align with established methodologies and standards.

MRV activities need to cover all relevant greenhouse gases, carbon dioxide, methane, nitrous oxide and their sources, energy production, transportation, land use changes, afforestation. Measurement methodology must be accurate and precise to provide reliable data for decision-making or influence policy development. The process should be transparent, allowing stakeholders to understand how emissions/removals are measured, reported, and verified. To facilitate comparisons and tracking progress over time, MRV methodologies should be consistent and compatible across different sectors.

Lesotho, despite its small size and population, is not immune to the impacts of climate change. Development of MRV will help the country to identify key sectors responsible for emissions and prioritise mitigation efforts accordingly and informs into which sectors require investment in cleaner technologies or practices.

2.2 MRV for Mitigation Actions

Mitigation actions are interventions and commitments of the country to reduce its GHG emissions. These interventions can be in the form of policies and projects. The actions involve the adoption of clean and renewable energies, and the implementation of energy-efficient measures in various sectors of the economy such as households, industry, and transport as an example.

In the previous NDC, Lesotho committed to unconditionally reducing her GHG by 10% by 2030 relative to a business-as-usual scenario. An additional 25% GHG reduction was to be achieved with external support in the form of finance, investments, technology development, and transfer and capacity building for the energy sector, in the revised NDC, Lesotho commits to unconditionally reduce its GHG emissions by 4.2% (166kt CO_2eq). Additionally, Lesotho commits to reduce her GHG emissions by 25.8% (1,017kt CO_2 eq) with international support. These two scenarios bring the total emission reduction to 30% below the BAU by 2030.

Table 1 Mitigation Actions from Revised NDC for Energy Sector by 2030

MITIGATION MEASURE	**Unconditional (Gg CO_2 eq)**	**Conditional (Gg CO_2 eq)**
More efficient gasoline cars	8.93	17.86
Restrictions on imported used cars	14.24	14.24
More efficient diesel cars	N/A	1.57
New bicycles lanes	10.30	20.60
Biogas at rural farms	12.12	18.18
Solar LED Lamps	4.32	16.21
LPG stoves replacing woods	13.23	49.62
Efficient wood stoves	22.68	83.16
Landfill gas plant with power production	N/A	728.45
Electrification connection	187.93	187.93
Solar water heaters	N/A	24.73
Solar home systems	3.29	6.57
Solar cooking	11.98	13.48
Two-wheelers	N/A	N/A
TOTAL	476.95	1,182.6

The MRV for mitigation in Lesotho will assist the country to track its progress towards achieving the targets in the tale above. In the draft revised NDC, alignment with the sustainable development goals was assessed and most of the mitigation measures address at least one SDG. The MRV for mitigation provides an ample opportunity to assess the development effects of the proposed mitigation. For example, this may be in the form of improved health conditions for households that cook in open fire after adopting energy-efficient cook stoves.

Lesotho has relatively abundant renewable sources of energy in the form of solar, hydro, and wind. Currently, there are several ongoing initiatives for the development of large-scale solar power generation plants that will be connected to the grid. A 30MW solar plant is completed at Ha-Ramarothole in the south of the country. This plant is connected to the national grid. A second phase of the plant of 50MW is under

development. Lesotho Highlands Development Authority will carry out a detailed feasibility study of the Oxbow hydropower plant in the North. Although the grid-emission factor of Lesotho is zero, MRV for mitigation can be used to measure the socio-economic benefits of such projects.

2.3 MRV of Technical and Financial Support

MRV of technical and financial support encompasses closely monitoring the implementation of projects or programs, reporting on progress and outcomes, and verifying the accuracy and effectiveness of the support provided. These processes are essential for ensuring accountability, transparency, and the successful achievement of development goals.

This is a systematic collection of data and information to track progress. In the case of technical support, monitoring involves tracking the implementation of activities, assessing the uptake of new technologies or practices, or evaluating the performance of systems or processes. Financial monitoring, on the other hand, involves tracking the disbursement of funds, expenditures, and budget utilization. Reporting entails compiling and communicating the results of monitoring activities to relevant stakeholders. It includes preparing regular reports on the progress of projects or programs, documenting achievements and challenges, and highlighting any deviations from planned targets. Reporting is essential for transparency and accountability, allowing donors, beneficiaries, and other stakeholders to understand how resources are being utilized. Verification should be conducted by assessing the accuracy and reliability of the reported information. This could involve conducting audits, site visits, or other forms of review to validate the data and ensure compliance with agreed parameters, standards and guidelines. Verification helps to detect errors, identify areas for improvement, and ensure that the resources provided are being used efficiently and effectively.

There are ongoing renewable energy projects which have received support from international cooperating partners. The United Nations Development Programme has provided support to the Department of Energy for development of the mini-grids for communities that are far from the grid. The European Union is currently supporting the Ministry to implement institutional reforms in the energy sector. These reforms entail the establishment of the Energy Commission, Establishment of Energy Fund which will finance new projects in the energy sector.

Dependence of National GHG Inventory and MRV of Mitigation Action

The national inventories are a critical element in designing national mitigation goals, tracking goal progress, and assessing goal achievement (which is MRV by definition). When designing a mitigation goal, national inventories are needed to identify high-emitting sectors, mitigation opportunities, and target significant emission sources. To track the progress towards the goal, an inventory is needed to calculate base year emissions. At the end of the planning period, the government needs to review the national inventory to determine whether the goal has been achieved. This shows the importance of accurate and reliable data when preparing inventories.

These projects include:

- The Lesotho Renewable Energy and Energy Access Project (LREEAP), receiving support from the World Bank. The main objective of the project is to extend electricity grid to designated industrial zones and promote use of off-grid using solar PV mini-grid.
- The Development of Cornerstones Public Policies and Institutional Capacity to Accelerate Sustainable Energy for All (SE4ALL), backed by the United Nation Development Programme (UNDP). The UNDP

has provided support to the Department of Energy for the development of the mini-grids for remote communities lacking access to the main grid.

- Enhancing Lesotho's Readiness for Clean Energy Transition supported by United Nation Industrial Development Organisation (UNIDO): The project's objective is to enhance the readiness of Lesotho's private sector to develop, commercialise and invest in clean energy.
- Katse 1.1 MW Mini-Hydro Project, supported by Japanese International Cooperation Agency (JICA).
- The National Electricity Infrastructure Project, receiving support by the African Development Bank.
- Support for Energy Reforms, funded by the European Union (EU). This endeavour aims to improve the governance of the energy sector by enhancing coordination within the Department of Energy and implementing the Energy Policy for the period 2015 to 2025.

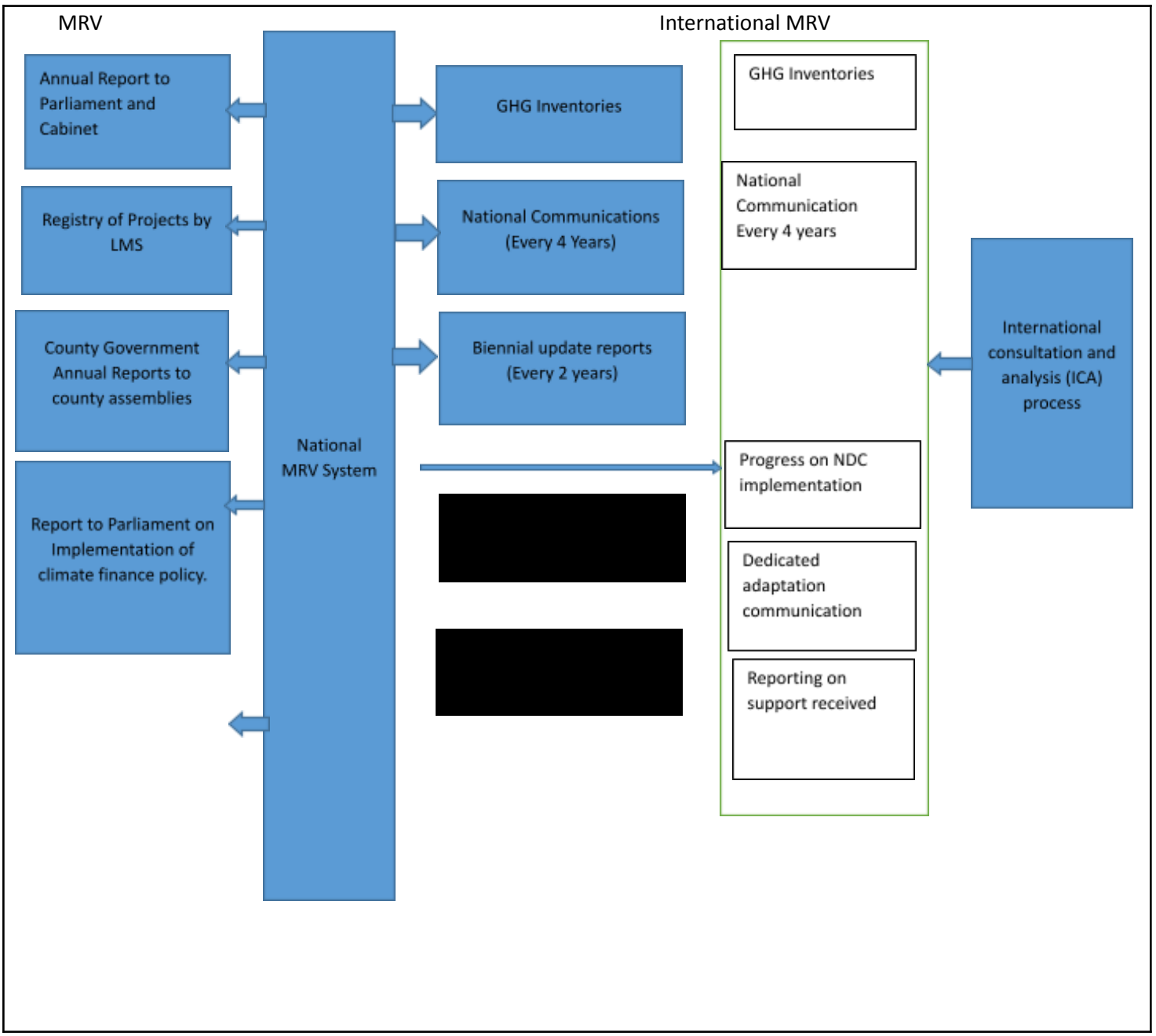


Figure 2: Schematic Diagram of MRV System (Murphy D., et al Sept 2019)

Figure 2 above depicts two channels of reporting for Lesotho to meet both local and international reporting obligations. On the domestic side, the reports that are required for MRV are:

- Annual reports of climate change activities undertaken by LMS.
- National Climate Change Action Plans (NCCAP). This will include planned activities of the year of LMS with stakeholders in the issues of climate change.
- Inventory of mitigation options in the NDC.
- Budget performance the report provides information on all funds supporting the activities of LMS. This report will be shared with the Natural Resources and Environment and portfolio committee of the National Assembly of Lesotho.

The reports for international reporting obligations include the following:

- Greenhouse Gas (GHG) inventories.
- National Communications.
- Biennial Transparency Reports.
- Annual progress reports on targets set within the NDC.
- Reports on the financial flow of support for climate change activities.

3. STATUS OF THE MRV SYSTEM IN LESOTHO

The policies, regulations, and legal frameworks supporting MRV activities in Lesotho provide a foundational basis for monitoring and reporting climate actions and GHG emissions. However, significant gaps remain in terms of detailed implementation guidelines, capacity building, and sustainable funding. Enhancing these areas through legislative updates, institutional strengthening, and continuous international support will be crucial for developing an effective MRV system in Lesotho.

The process of MRV is not institutionalized in Lesotho. However, Lesotho has always complied with the reporting obligations to the UNFCCC. The reporting requirements included the preparation of GHG inventories, National communication (Initial communication, second National-(SNC), Third National Communication-(TNC), Intended National Determined Contribution (INDC), and Nationally Determined Contribution (NDC). These initiatives indicate the commitment of Lesotho to meet the MRV requirements as stipulated by the Paris Agreement.

The first NDC was prepared in 2017. The NDC provided a trajectory of GHG emissions for the business–as–usual (BAU) scenario and the reduction of GHG emissions as a result of implementing mitigation options. The NDC depicted the trajectory of GHG emissions for both conditional and unconditional scenarios. Under an unconditional scenario, Lesotho pledges to reduce GHG emissions by 10% from BAU in 2030 starting from 2017. For the conditional scenario, Lesotho intends to reduce GHG by 35% from BAU in 2030. Lesotho's NDC under the Paris Agreement commits to reducing GHG emissions and includes provisions for MRV to ensure transparent and accountable reporting. The NDC highlights sector specific MRV needs, particularly in agriculture and energy.

Environment Act (2008) provides the legal basis for environmental protection and management in Lesotho, which includes provisions for monitoring environmental impacts. It mandates the establishment of an Environmental Information System (EIS) to support data collection and reporting. In the same way, the Lesotho's Energy Policy (2015-2025) is aligned with the MRV requirements under the UNFCCC to support its climate change mitigation efforts. The Policy focuses on enhancing energy access, promoting renewable energy, and improving energy efficiency while ensuring environmental sustainability. It emphasizes on increasing private sector participation to foster innovation and investment in clean energy technologies crucial for achieving the country's climate and energy goals (Green Climate Fund 2021).

In addition, Lesotho is working towards improving its institutional and regulatory frameworks to support better data collection and reporting on energy resources. This includes creating a reliable and efficient transmission network to ensure consistent power supply and transparent, competitive electricity market operations. These steps are vital for meeting the enhanced reporting requirements and ensuring the quality and frequency of National Communications (NCs) and Biennial Update Reports (BURs) as stipulated by the UNFCCC, (World Resources Institute 2021).

Four GHG inventories were prepared and submitted – The first National GHG Inventory was compiled in 2000 for the year 1994, while the second National GHG inventory was undertaken for the year 2000 and was published in 2013. Both inventories were based on the revised IPCC guidelines. The third National GHG Inventory was published in 2018, covering a period of 2005 to 2010. The inventory was based on 2016 IPCC guidelines. The fourth inventory was published in 2019 covering a period of 2011.

3.1.1 The National Strategic Development Plan (NSDP II) Lesotho (2017/18 - 2021/22),

This is a national development plan that guides the strategic issues for the development of the country. The plan recognizes the fact that extreme weather events undermine the country's ability to achieve long-term development objectives and goals. It outlines the country's strategic priorities and interventions aimed at promoting sustainable development. In the context of addressing the MRV framework the NSDP II includes several key elements and initiatives. The strategy highlights on enhancing capacity development of institutions responsible for climate change policy, ; promoting renewable energy projects, such as solar and wind, to reduce dependency on fossil fuels and lower GHG emissions; Implementing climate resilient agricultural practices to reduce vulnerability and emissions from the agriculture sector ; ensuring that climate action processes are integrated into broader national development plans and securing funding from international climate finance mechanisms.

3.1.2 National Climate Change Policy (NCCP) 2017-2027

The National Climate Change Policy (NCCP) 2017-2027 of Lesotho includes provisions related to Measurement, Reporting, and Verification (MRV) in accordance with the United Nations Framework Convention on Climate Change (UNFCCC) requirements. The policy emphasizes the need for establishing MRV systems to track and report greenhouse gas (GHG) emissions, climate actions, and their impacts. This involves developing comprehensive data collection, management, and reporting frameworks that align with UNFCCC guidelines. Furthermore, it highlights the importance of building the technical and institutional capacity necessary for effective MRV implementation. It also underscores the importance of transparency and accountability in climate action reporting which addresses the intention of MRV to provide accurate and verifiable information, ensuring that climate actions and their outcomes are transparent and credible. Effective MRV needs partnership and the NCCP encourages collaboration with international, regional, and

local partners to enhance MRV practices. The following statements capture the relevancy of MRV for efficient implementation of MRV systems.

Policy Statement 4: Develop renewable energy sources and increase energy efficiency.

Policy Statement 6: Promote climate resilience and reduce greenhouse gas emissions in manufacturing.

Policy Statement 8: Enhance best practice for forestry and rangelands to mitigate and adapt to climate change.

Policy Statement 11: Promote low-carbon and climate resilient transport systems.
Policy Statement 12: Climate proof human settlements and infrastructure

Policy Statement 15: Strengthen climate change governance frameworks.

Policy Statement 19: Implement education, training, public awareness and communication programmes.

Policy Statement 20: Promote research and development, innovation and technology transfer.

Policy Statement 21: Mobilize financial resources.

On the same matter, the National Climate Change Policy Implementation Strategy (NCCPIS 2017) Lesotho outlines the country's approach to addressing climate change. One of the key components of this strategy is the MRV system in accordance with the UNFCCC. The strategy includes setting up baseline data for various greenhouse gas (GHG) emissions sectors, including energy, agriculture, waste, and industrial processes.

3.1.3 The Lesotho Energy Policy (2015-2025)

The Lesotho Energy Policy serves as the primary framework for progress in the energy sector. Key aspects of the policy are its objectives that include; Enhance energy access and security, promote sustainable energy development and reduce GHG emissions through increased use of renewable energy sources. The main focus on renewable energy is to Increase the use of solar, wind, and hydropower; develop infrastructure for renewable energy projects; Implement energy saving measures; promote energy efficient technologies and encourage private sector investment in renewable energy.

The Policy supports the MRV framework by promoting renewable energy, enhancing energy efficiency, establishing data management systems, and strengthening regulatory frameworks. Through capacity building and alignment with climate strategies, the policy ensures that Lesotho can effectively measure, report, and verify its progress in reducing GHG emissions, thereby fulfilling its commitments under the UNFCCC. The policy has led to increased investment in renewable energy projects and created an enabling environment that encourages investment in the energy sector. This may include facilitating the establishment of international/local/public-private partnership (PPP) and Renewable Energy-Feed-In-Tariffs (REFIT) programs. Preliminary assessments (GHG Report 2013) indicate a positive impact on reducing GHG emissions due to increased renewable energy usage.

3.2 Gaps in Policies in addressing MRV

While the policies outline the importance of MRV, well prepared and addresses key essential issues to climate change, detailed implementation guidelines and specific targets for MRV activities are less defined. This can lead to inconsistencies in how MRV activities are conducted across different sectors. Moreover, the NCCP does not highlight clearly on institutional frameworks specifically tailored for MRV activities and that might affect coordination among stakeholders who will be involved in data collection and reporting. On the same note, it does not adequately address the establishment of comprehensive data management systems needed for effective MRV which could pose likelihood to impact the quality and reliability of greenhouse gas inventories and mitigation action reports. There is insufficient emphasis on capacity building for MRV processes.

LMS and the Department of Energy (DOE) were under one Ministry. This means that the exchange of information between the two entities was relatively easy. This does not pose any major problem. However, the challenge in exchanging data between two ministries may require immediate attention to ensure a seamless flow of information between the two. When the two departments were in the same ministry the exchange of information did not require any formal channels to be followed if there a need for information from energy to LMS or vice versa. The current arrangement requires formalized communication for the information exchange.

In financial year 2015/16, the Department of Energy initiated the Energy Sector Coordination Forum (ESCF). This forum serves as a platform for stakeholders in the energy sector to share information about their respective projects, including their status. To stay informed about the latest developments in the energy sector, LMS's continued participation in this forum is essential.

Data availability is a challenge in some sectors. In some instances, even when such data is available, it is not in the form that will assist in building a reliable MRV system. The areas of concern in the energy sector are biomass resources and utilization and transport. Although biomass is the main energy source for rural areas, it is not known how much quantities are in stock, and quantities used are more of an estimate than anything to go by. This gap will render it difficult to carry out the actions in the policy. In the transport sector, the data from the Ministry of Traffic and Transport relating to vehicle population does not provide any information on vehicles by fuel type. This makes it impossible to accurately know the using a certain grade of petroleum fuels.

Financing is one of the key elements for a successful MRV. The NCCP recognizes the importance of this element and has included it in the policy statement. One of the actions listed under this policy is the establishment of the Climate Change Fund (CCF). One of the necessary steps to implement this policy will

define the process to be followed to establish a Climate Change Fund. This may involve enacting the current policy as an act of parliament with the provision of the establishment of a fund. Alternatively, CCF can be established through the provision of existing legislation which is the Finance Order of 1980. The setback with this piece of legislation is that the fund will be under the Minister of Finance as opposed to having the fund under the Minister responsible for climate change. It is also important to establish the source (CCF), DOE, and NCCP of such funds and how the money will be collected. Some possible sources of money can be through levies-imposed fuel use for private vehicles, grand or donor funds. Similarly, even though NDC Lesotho committed to reducing GHG emissions the implementation of its MRV systems is challenged due to limited technical capacity and financial resources, data collection and management, standards and parameters systems to support inclusive MRV activities. The inadequacy makes it necessary to update and align with current international MRV standards and practices.

4. INSTITUTIONAL ARRANGEMENTS FOR MRV

The implementation of a successful MRV system requires a good institutional arrangement. This will enhance the synergy of various stakeholders who have some role to play in efforts to reduce GHG emissions for Lesotho. Among the key institutions to run effective MRV systems are: The Ministry of Environment and Forestry lead in coordinating MRV activities and oversees the implementation of climate related policies and ensures compliance with international commitments under the UNFCCC and serves as a secretariat to the National Climate Change Committee (NCCC) the body that serves as the focal point for climate change activities, including MRV. Lesotho Meteorological Services is primarily responsible for collecting and managing climate data, including greenhouse gas (GHG) emissions inventories.

The Bureau of Statistics (BOS) supports on data collection by providing statistical data that is crucial for MRV, such as population, economic activities and land use. The Ministry of Agriculture and Food Security provide data and information related to land use and agriculture which are essential for GHG inventories. The National University of Lesotho (NUL) contribute to research and expertise on climate change impacts, mitigation, and adaptation. The Ministry of Energy is supposed to be responsible for collecting and managing data related to energy consumption, production, and greenhouse gas (GHG) emissions. The Ministry of Transport be responsible for collecting data on emissions from the transport sector. This includes information on vehicle types, fuel consumption, vehicle kilometres travelled, and emissions factors. The figure below highlights the proposed institutional arrangement on MRV.

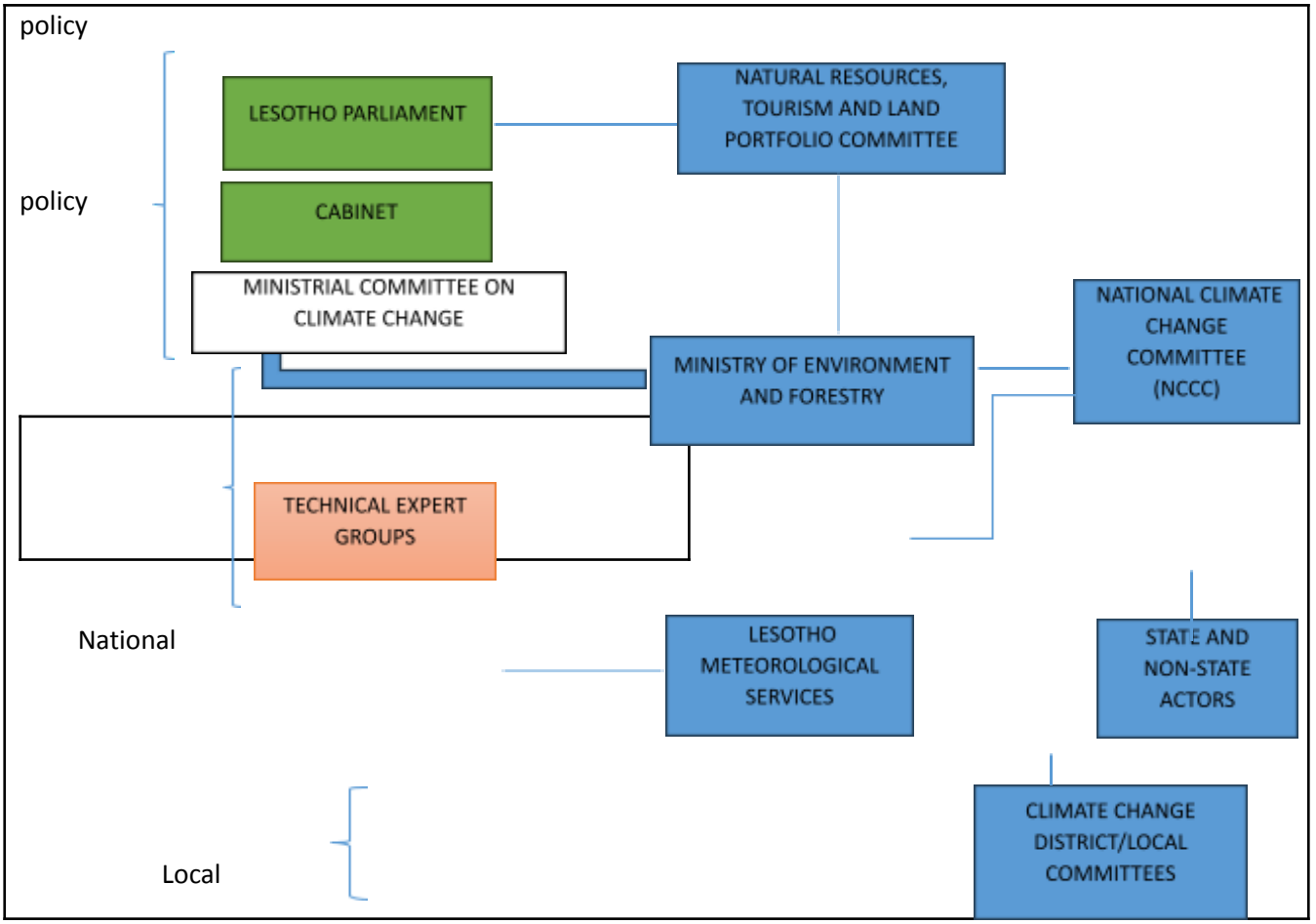


Figure 6: Proposed Institutional Arrangements (NCCP, 2017-2027)

Lesotho Meteorological Services (LMS) - The LMS will remain a lead institution for the MRV system in the energy sector. This entity has sufficient competence and skills to run the MRV. It has already met the national reporting requirements in the past by submitting the first NDC in 2017, preparing a biennial update report in 2021, and preparing the National GHG Inventory report. These are a few examples that show the competence level within the Department. It is therefore not necessary to establish a separate entity dedicated to MRV only as LMS did the task successfully in the past. What needs to be done is to strengthen the institution in terms of manpower and capacity building in the form of short and long-term training. The United Nation Framework Convention on Climate Change Secretariat developed a network of National Focal Points whose responsibility is to report activities pertaining to climate change. The LMS is designated as the National Focal Point for Lesotho.

The National Climate Change Committee (NCCC) has been established under the armpit of LMS in 2013 to coordinate climate change issues in the country. (NCCP – 2017-2027) The committee serves as a multi-stakeholder forum where pertinent issues to climate change are discussed the information is exchanged on the activities of different actors. This provides support in terms of gathering the information and coordination of stakeholders. The committee also serves as advisory body to the Principal Secretary of

the Ministry of Environment and Forestry (MEF) and it has three sub-committees namely Finance, public outreach, and Monitoring and Evaluation. (M&E). The sub-committees are composed of the key stakeholders of the users of climate change. As part of strengthening the existing sub-committee, it is recommended that the Ministry of Transport be incorporated into the monitoring and Educational sub-committee. This entity has a key role in terms of information and data requirements in transport for MRV systems. It is a fact that transport is one of the large emitters of GHG. Omitting it in this subcommittee will create a gap in the information flow related to transport. The other entity that has to be included in the M&E subcommittee is the Bureau of Standards under the Ministry of Trade and Industry. The specific role of this entity is to set minimum standards for appliances and labelling on goods consumed.

4.1 Institutions consultations and feedback on MRV

The report from the technical dialogue of the first global stocktake encourages increased ambitions in successive NDCs and emphasised that enhanced transparency from NDCs can help track progress (UNFCCC technical Dialogue 2023) and developing country parties (Lesotho) are expected to communicate in submitted NDC and BUR documents their needs for finance, and capacity building as well as progress made on mitigation and adaptation implementation.

Therefore, it is important that Lesotho undergo sectoral assessment in order to obtain true reflections on her capacity on MRV support systems. Domestically, conducting MRV helps countries understand key sources and sinks of emissions, design effective mitigation strategies as part of their NDCs, SDGs or other programs, assess impacts of mitigation projects and policies, track progress toward climate goals, meet stakeholder demands for public disclosure of GHG information, and enhance credibility and promote good governance, among other objectives (WRI 2016). UNFCCC guidance advocates for the identification of key sectors in a country which are responsible for a high proportion of a country's emissions. The table below underscores stakeholder's capacity on MRV systems.

Table 7: Stakeholder's Capacity on MRV System

Institution	Supporting legal Frameworks	Organisational setup/Human resource	Technical/Financial Capacity	Data and Information systems	Quality Assurance and Control	Reporting Systems National/International	Capacity Building
LMS							
Department of Energy	Statement number 2 of Energy Policy 2015-2025 Fuel and Service Control 1983	Personnel from IT and Statistics working in relation with LMS	Inadequate since the department has staff high turnover & have limited funds	Developed Energy Information Management System & have Energy Balance Studio	No parameters & standards	At the ministerial level SADC AU-AFREC IEA IRENA	Inadequate
BOS	Not specifically addressing MRV alone	Data Dissemination Division	Inadequate	Use designed data collection tool	Use Standards Tool that has verification standards	Report at ministerial level and to the UNFCCC Focal Point –Lesotho Meteorological Services	Inadequate
Transport	Draft Transport plan 2023 even though it has minimal on climate change MRV	There is personnel	None	Not related to MRV but mostly on car fitness, registration	Data Sector Report but no parameters or standards	Report only at ministerial level	None
RSL	None	None	None	None	None	None	None
Forestry	Policy under review	Forest Division	Inadequate	Not related to MRV	No standards and parameters capacity	Report at ministerial level and Forest Resource Assessment (FRA) FAO	Inadequate
Agriculture	No MRV alignment but legal frameworks under review	None	None	Not related to MRV	No standards and parameters capacity	Report only at ministerial level	None

4.2 DATA ANALYSIS GAPS, BARRIERS, AND NEEDS

Addressing the main pillars of transparency; MRV, institutional arrangements, and country capacity, as well as incorporation of new data sources, can lead to better reporting and more reliable communication of NDC progress for Lesotho. However, there are common prevailing challenges across the key MRV embedded sectors with a minimal exception on the Bureau of Statistics (BOS Lesotho), these include;

4.2.1 Lack of Data Infrastructure:

The country lacks the necessary infrastructure for collecting, managing, and analysing data related to energy consumption, particularly at the granularity required for MRV under UNFCCC. This includes the absence of databases, data management systems, and skilled personnel for handling energy-related data. In addition, findings have indicated that, access to reliable and current data on energy consumption, particularly regarding gasoline car efficiency and SHS usage, are limited. This is due to myriad factors that include; inadequate mechanisms for data sharing among stakeholders, including government bodies, private sector entities, and research institutions, Inadequate technological infrastructure for data collection, storage, analysis, and dissemination and limited availability of tools and resources for implementing advanced data collection methods such as remote sensing, GIS, and statistical analysis and the cost of acquiring and maintaining these technologies can pose a barrier to implementation. There is also a data gap on Insufficient existing data on energy consumption, production, and emissions due to limited access to reliable energy data and lack of standardised reporting mechanisms and data sharing protocols (sectors interviews 2024).

4.3 Limited Institutional Capacity

The consultations have also discovered that there is limited institutional capacity within relevant government departments responsible for energy management and environmental monitoring. This includes insufficient expertise in data collection methodologies, MRV frameworks, and compliance requirements because of limited expertise and resources for establishing or maintaining data collection systems (sectors interviews 2024).

4.4 Policy and Regulatory Challenges

Moreover, there is a challenge on legal frameworks that do not clearly encompass MRV systems. In most cases policies and regulations related to energy reporting and monitoring are under review and that on its own is a barrier into establishing a comprehensive data collection system. And in Lesotho situation, harmonising existing policies with UNFCCC requirements and ensuring compliance across sectors may be challenging because of indistinct policies or regulations mandating comprehensive data collection and reporting for the energy sector. The obstruction factor in this aspect is lack of legal frameworks or enforcement mechanisms to ensure compliance with data reporting requirements (sectors interviews 2024).

4.5 Low Capacity and Human Resource Support

Lack of training programs to build the capacity of personnel involved in data collection, management, and analysis is a central challenge in the MRV process in all sectors. Most sectors indicated that MRV process is relatively a new concept therefore, it is not even catered for in their training plans. Again, when it comes to MRV process, sectors seem to work in silos and in uncoordinated manner. Effective MRV for the energy sector requires coordination among various stakeholders, including government, private sector entities, civil society organizations, and international partners to avoid uncoordinated efforts which will create fragmentation and possibility to slow down initiatives to design and implement an integrated data collection system (sectors interviews 2024).

4.6 Access to Climate Finance challenge

According to CDKN Global (2016) developing countries should have an MRV system that allows them to plan their financing, monitor implementation and compliance, assess the financial costs associated with climate change, and report and verify the application of standards and good practices in order to unlock funds that could constitute the US $100 billion per year (Babacar Sarr 2018). And findings have indicated that, one of the primary barriers for implementing MRV systems in Lesotho is the limited financial resources available. The country, with its struggling economy and competing development priorities, will often brawls to allocate adequate funds to build the necessary infrastructure, acquire technology, and train personnel for effective MRV. Furthermore, MRV requirements under the UNFCCC can be complex and stringent, requiring detailed methodologies, monitoring systems, and reporting mechanisms and with limited human capacity on MRV could be an additional challenge to unblock funding opportunities since these frameworks requires significant resources and technical expertise. Moreover, unclear incorporation of MRV

systems in policies and regulatory frameworks could be another possible deterring factor to access finance on MRV process in Lesotho. Dependency on external funding sources is a syndrome that may lead to uncertainty and inconsistency in funding availability and denies the nation long term planning on MRV (sectors interviews 2024).

4.7 Low Quality Assurance and Control

QA/QC processes are integral to ensuring the reliability, accuracy, and consistency of data reported under the UNFCCC MRV framework. They help to build confidence in the reported information and support informed decision making for climate actions. However, as mentioned earlier, Lesotho has limited technical capacity both in terms of skilled personnel and technological resources which are a significant barrier to ensuring the quality of MRV processes. Furthermore, resources constraints, including budget limitations and competing priorities for personnel are barriers to effectively monitor and verify the performance of initiatives like efficient gasoline cars and Solar Home Systems (SHS). This is coupled by poor monitoring infrastructure to accurately track and verify the performance on the initiatives.

Table 2: Requirements for MRV System

MRV System Requirement	**Status**	**Challenge**	**Proposed Solutions**
good strategic plan	Not yet developed	No capacitated personnel	Capacity development
good metrics for strategic analysis	Not yet developed	Inadequate technical expertise	Capacity development
competent human resources	Low capacity	No clear training plan	Development of training plan and coordination of relevant government ministries and peripherals institutions Conduct energy audits
sufficient financial resources	Not adequate	Lack of strategic plan contributes to improper budgeting and financial mobilisation.	Development of costed strategic plan against activities
computational resources	Not adequate	No adequate funding	Financial mobilisation for the acquisition of

			computer hardware and software
Competence scientific systems.	Not adequate	Lack of personnel training Weak institutional arrangement	Capacity development

Source (BUR 2021)

5. THE MITIGATION OPTIONS PRIORITIZED IN THE NDC

The revised NDC has proposed 14 mitigation actions under the conditional scenario and 10 mitigation actions under the unconditional scenario. Some of the mitigation options have policy implications as the Table 2 below.

Table 3: Mitigation Options with Policy Implication

MITIGATION	REDUCTION OF GHG (kt CO_2eq)
Efficient gasoline cars	17.86
Efficient wood stoves	83
Electrification of households	187.93

5.1.1 Solar home system- tax incentives policy

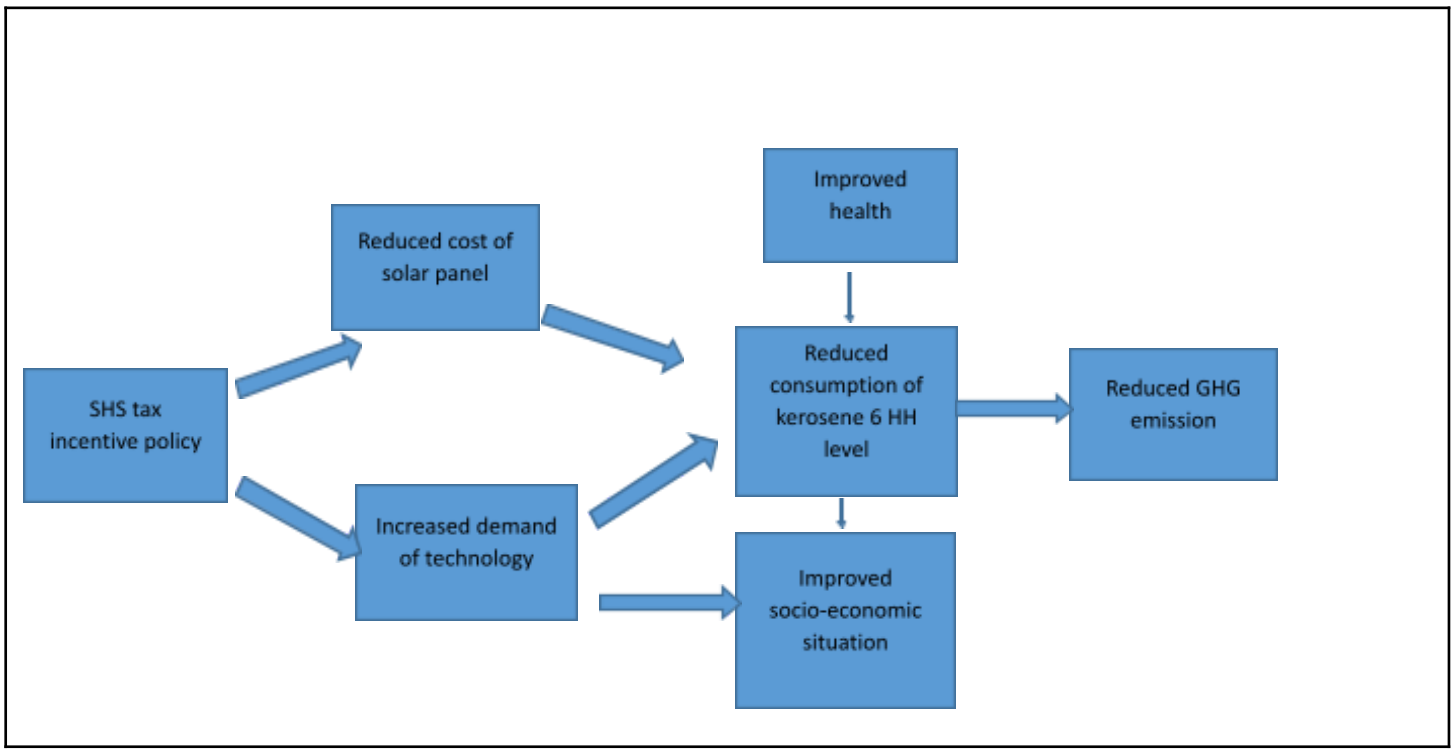
The National Energy Policy 2015-2025 supports the pricing structure that will enhance the affordability of solar photovoltaic technology photovoltaic (PV) systems, namely; renewable energy Feed-in-Tariff programme and reduction of levies and taxes on imported components of renewable energy systems are two of these initiatives. The renewable energy feed-in tariff is one of the strategies to promote investments in the renewable energy technologies. The specific policy statement addressing this issue is policy statement 14 which addresses the issue of investment framework and financing. The feed-in-tariff is applicable to large scale grid connected system.

The grid emission factor for Lesotho is zero and therefore any grid-connected renewable energy generation system does not have any impact in terms of reducing GHG emissions. However, the solar home system supplied to rural households will reduce the quantity of kerosene used for lighting in rural areas. It is estimated that this action will reduce 16.21 CO_2eq by 2030 (Revised NDC,) if implemented successfully as proposed in the revised NDC under the conditional scenario. The strategy for wide adoption of the actions would be in the form of tax reduction on imported components of solar PV systems. The reduced taxes for solar home systems will enhance the affordability of solar panels and thereby increase the number of systems acquired.

The lower prices will improve the business for the dealer making solar technology attractive to commercial enterprises. The Feed-in-Tariff and Auction apply to large generation systems. The strategy for the adoption

of tax incentives may involve the exemption of import duties on solar panels, a targeted subsidy intended to reduce value-added tax (VAT) on solar panels. Since the revenue authority is the only entity charged with the responsibility of collecting different taxes on goods imported and sold in the country, some discussions have to be initiated on the implementation of this mitigation measure. Figure 4 below shows the causal chain for tax incentive policy on solar home systems.

Figure 4 Casual Chain of Tax Incentive Policy on Solar Home Systems



(ICAT Renewable Energy Assessment Guide, July 2023)

The tax incentive has the potential to reduce the cost of the solar panels and the reduced cost of this component will directly increase the demand of the SHS. The increased demand for the technology will translate into lower consumption of fossil fuels (kerosene). There are some negative health impacts of using kerosene for lighting such as poor-quality light which may affect the learning conditions for children at home in the evening. The quantity of kerosene used for lighting after implementation of policy.

The other spin of benefits that will be generated by the policy is that the market of solar home systems will increase in the energy sector and attract wider private sector participation.

5.1.2 Indicators for assessing progress on implementation of tax incentive policy

A primary goal of the MRV system is to help parties evaluate their advancement in achieving their Nationally Determined Contributions (NDCs). For that to happen, there must be clear indicators to measure the

progress resulting from the action. Table 3 below gives a list of indicators that can be used for assessing progress on implementation of tax incentive policy for SHS.

Table 4: List of Indicators on Tax Incentive Policy for Solar Home Systems

POLICY	INDICATORS
Tax incentives for solar home system	Number of SHS installed Number of solar company's participation Amount of tax rates received by companies Number of health incidences related sight in rural areas Performance of children at school The flow of financial resources for implementing and administering the policy Number of new businesses participating in sales and installation of solar PV systems Number of rural businesses resulting from better lighting facilities

The frequency of monitoring the indicators has to be set at the early stage of implementing the mitigation measures proposed in the revised NDC. It is proposed to monitor these indicators, the assessment be done every two years to track the progress of tax policies on the NDC. The information obtained from such an exercise will inform the Biennial Transparency Report (BTR) of the country. It can also be used to measure the quantity of GHG that has been reduced as a result of implementing the activity.

The revised NDC was completed and this means that as part of the MRV process, the measurements for MRV will be initiated in 2024 and continue through 2030. In other words, the monitoring exercise on assessing the activities in the energy sector is expected to start as early as possible to track the progress towards achieving the NDC for the energy sector. This exercise will involve measuring quantities of GHG emissions and the impact of the mitigation option implemented.

5.1.3 More Efficient Gasoline Cars

Table 5: List of Indicators for MRV in Transport

POLICY	INDICATORS
More efficiency gasoline cars	- Number of gasoline cars registered per annum
	- Consumption volume of gasoline
	- Number of persons using other modes of transport
	- Number of training workshops held for transport operators

The transport sector consumes more than 90% of petroleum fuels consumed in the country. It also contributes to the 16.2 % of GHG emissions in the country (BUR1, 2021). The vehicle population has been increasing constantly in the past years following easy access to import of vehicles from outside the region. The fuel efficiency of these vehicles is not tested or verified before they are registered in the country. The consumption of petroleum fuels is also increasing following the increase in fleet size. The transport sector plays a very important role in the economic activities of the country.

Lesotho depends almost entirely on road transport for its transport needs. The other modes of transport such as aviation and rail operate at a very small scale and cannot sustain the economic activities of the nation. The reduction of GHG emissions can be achieved through policy instruments that will discourage wasteful consumption and one such is caseation. The tax policies that promote the efficient use of Gasoline fuel are identified as a measure that will contribute to the reduction of GHG emissions in the country. One of the policy objectives of petroleum production is to promote energy efficiency in the petroleum subsector.

Among the strategies that will be adopted to achieve this target is to develop and implement energy efficiency programs in the petroleum sector. The price structure of petroleum fuels has several elements that are tax related. The re-arrangements of these elements can improve the efficiency level of the use of gasoline in vehicles. The tax elements in the price structure are as follows:

- Value-added tax (VAT)
- Motor vehicle assurance (MVA)
- Oil levy.
- Road maintenance levy
- Petroleum fund levy

There is a general perception that motorists are heavily taxed in the country. For that reason, it may not be necessary to put additional task items over and above the existing ones. The strategy that can be applied is to spread the percentage across different items in such a manner that inefficiency will pay at a higher rate than efficient consumption of gasoline. A minimum standard has to be set where consumption per distance travelled has to be stipulated. Such information has to be collected at the time of registering a car and the performance of gasoline consumption has to be assessed every two years. This information will assist in classifying each car by efficiency level.

The tax elements in the price of fuel must have clear benefits to the transport sector and the economy as a whole. This is especially the case where tax elements discourage wasteful use of fuel. The other components such as improved efficiency of public transport will make it possible to implement this policy. The long-term plan must be geared towards shifting from fossil fuel-powered vehicles to electric and hybrid vehicles. The road infrastructure must be improved to encourage efficiency in the transport sector. The roads are mostly in a poor state of repair, negatively affecting the efficiency of motorists.

6. RECOMMENDATIONS

While measurement deals with data and information under rigorous scientific and technical methodologies, reporting and verification are important to demonstrate transparency, completeness, consistency and reliability. Therefore, it is recommended and encouraged that for Lesotho to have an effective MRV systems in place, the country should;

6.1 Provide regular training sessions for government officials, local authorities, and relevant stakeholders to enhance their understanding of MRV processes and methodologies and this should include training on data collection, reporting, and verification techniques.

6.2 Develop a legislation that mandates MRV activities for all relevant sectors, ensuring compliance with UNFCCC guidelines and Integrate MRV requirements into national policies and strategies to ensure alignment with Lesotho's Nationally Determined Contributions and other international commitments.

6.3 Create a centralised database for storing and managing climate data and ensure that it is accessible to all relevant stakeholders and is regularly updated.

6.4 Involve a wide range of stakeholders, including government agencies, private sector, civil society, and academia in the MRV process and establish formal mechanisms for stakeholder consultations and feedback.

6.5 Conduct awareness campaigns to educate the public and local communities about the importance of MRV and their role in the process.

6.6 Identify and secure funding from international donors, development partners, and climate finance mechanisms such as the Green Climate Fund (GCF) to support MRV activities.

6.7 Establish quality assurance and quality control procedures to ensure the accuracy, consistency, and reliability of data collection.

6.8 Involve and provide capacity for the third party in verification processes in order to enhance the credibility of reported data- MRV audits by independent experts or institutions.

6.9 Establish a continuous monitoring system amongst key MRV sectors to track progress on objectives and evaluate effectiveness.

7. Sector Specific Recommendations-Efficient gasoline car and Solar Home System (SHS).

In this regard, it is recommended that the country should use cleaner fuels and advanced technologies to further reduce emissions from gasoline cars. And for her to achieve this ambition, there is a need to develop standardised metrics for measuring the efficiency of gasoline cars, such as fuel consumption per kilometre travelled, CO_2 emissions per kilometre, and efficiency ratings. In support to reporting, it will require petroleum dealers to report detailed data on the efficiency of their gasoline cars, including fuel economy tests, emissions data, and any additional efficiency features. And for verification establishment of the independent entity will be required (third party) to ensure the accuracy of reported data. This could involve independent audits of manufacturers' testing procedures and data collection methods.

The same strategy goes in SHS; for monitoring, there is a need to establish metrics for assessing the performance including energy generated, CO_2 emissions avoided, and energy access provided to households. SHS providers have to report on the installation, capacity, usage data, and maintenance of solar home systems in a standardised format. And for verification purpose, there is a need to conduct regular onsite inspections and where possible establish a remote monitoring to verify reported data and ensure the proper functioning of SHS installations. This verification process will also need Involvement of local communities and stakeholders in the verification process. This will promote the use of high-quality components and installation practices to maximize the efficiency and longevity of SHS, thereby enhancing Lesotho environmental and socioeconomic benefits.

It is highly recommended that the country should adopt cross sectoral integration to improve MRV system in Lesotho. This will explore opportunities for synergies between transportation and energy sectors since they are core operational needs to other peripheral sectors (transport, Forestry, Agriculture). Furthermore, there is a need to create/establish integrated databases or platforms that combine data from various sources, including vehicle efficiency tests, fuel consumption records, solar energy production data, and household

energy usage information**.** To improve understanding of MRV requirements and enhance stakeholder's ability to implement effectively and efficiently, there is a need for provision of training and capacity building support that includes government, private sector and civil society organizations.

8. Annex 1: Institutional Capacity Questionnaire

Institutions	Supporting legal Frameworks	Organisational setup/Human resource	Technical Capacity	Financial capacity	Data and Information systems	Quality Assurance and Control	Reporting Systems National/International	Capacity Building	Recommendations
Department of Energy									
LMS									
BOS									
Trade									
Transport									
Mining									
RSL									
Forestry									
Agriculture									
LEC									

Guiding questions

1. Does your institution have any legal framework/policy/strategy/plan that support MRV system and how does your institution ensure compliance with these policies and regulations?
2. Does your institutional structure have a unit or department responsible for MRV activities and does it provide training or capacity-building initiatives to enhance MRV capabilities?
3. Are there any capacitated personnel involved in MRV activities and what are their key roles and responsibilities in the MRV process?
4. Does your institution have available or adequate financial resources allocated for MRV activities?
5. What methods does your institution employ for data collection related to greenhouse gas emissions, climate change impacts, and adaptation measures and how frequently are data collected, and what are the primary sources of data?
6. Please describe your institution's data management system for storing, analysing, and reporting MRV-related information.
7. How does your institution ensure the accuracy and reliability of MRV data and reports and how does your institution address any discrepancies or errors identified during the verification process?
8. Are there any independent verification mechanisms or quality assurance procedures in place?
9. How does your institution prepare and submit reports on climate change mitigation and adaptation efforts to the responsible entity in the country and what types of information are included in your reports (e.g., emissions inventories, vulnerability assessments, mitigation actions)?

MRV is an abbreviation that refers to "Measurement, Reporting, and Verification," and UNFCCC refers to the United Nations Framework Convention on Climate Change. MRV UNFCCC is a system designed to track and assess the progress of countries in meeting their climate change mitigation and adaptation commitments under the UNFCCC Lesotho, as signatories to the UNFCCC, is required to comply with MRV requirements. However, the obligations for developing countries under the MRV framework may differ from those for developed countries, recognizing differences in their capacities and responsibilities.

General outline of how developing countries should comply with MRV under the UNFCCC:

Measurement: Lesotho need to measure greenhouse gas (GHG) emissions and removals, as well as efforts to mitigate climate change and adapt to its impacts. This involves establishing systems for collecting data on emissions and removals from various sectors such as energy, industry, transportation, agriculture, and forestry.

Reporting: Lesotho is required to report GHG emissions and removals data, as well as information on climate actions and policies, to the UNFCCC. This typically involves submitting periodic national communications and greenhouse gas inventories to the UNFCCC Secretariat.

Verification: The country may undergo international verification of reported emissions and actions, through bilateral or multilateral processes. Verification may involve review and assessment of reported data, methodologies, and compliance with UNFCCC guidelines and requirements.

To comply effectively with MRV requirements, the country require support in terms of capacity building, technology transfer, and financial assistance. The UNFCCC provides various mechanisms and channels for such support, including the Green Climate Fund and the Technology Mechanism. Overall, compliance with MRV UNFCCC is essential for tracking progress towards global climate goals and ensuring transparency and accountability in climate action efforts worldwide.

Annex 2. METHODOLOGIES FOR DIFFERENT TYPES OF MRV

Methods for MRV of GHG Emissions

	MEASUREMENT		REPORTING	VERIFICATION
	Method	Data Requirements		
National GHG inventory	IPCC Guidelines for National Greenhouse Gas Inventories	▪ Activity data and emission factor ▪ Data requirements associated with calculating emissions from some sources, particularly non-energy sources (i.e., AFOLU), can be significantly more complicated. ▪ Data from continuous emissions monitoring system (CEMS) where feasible	**To the UNFCCC as part of:** ▪ National Inventory Reports for Developed Countries ▪ National Communications for developed and developing countries. ▪ Biennial Reports (BR) for developed countries, and Biennial Update Reports (BURs) for developing countries. Countries may also develop inventories solely for domestic objectives	▪ Prescribed by UNFCCC—International Consultation and Analysis (ICA) for developing countries, and International Assessment and Review (IAR) for developed countries. ▪ The Paris Agreement sets up a technical expert review process for the information provided by countries

Methods for MRV of Mitigation Actions

MEASUREMENT		REPORTING	VERIFICATION
Method	Data Requirements		

GHG effects	**For mitigation goals and policies:** ▪Guidance to be developed for tracking nationally determined contributions by countries as per the Paris Agreement ▪GHG Protocol Mitigation Goal Standard for mitigation goals set by governments. ▪GHG Protocol Policy and Action Standard for Mitigation Policies	**For mitigation goals:** ▪National GHG inventory ▪Other data requirements may include data on emissions and removals from the land sector, transferasocio-economic units (e.g., carbon credits and tradable allowances), depending on the kind of goal	▪Any reporting requirements developed in the future as per the Paris Agreement for post-2020 contributions ▪To domestic stakeholders ▪To the UNFCCC as part of National Communications, Biennial Reports, and/or Biennial Update Reports ▪To donors supporting the implementation of goals, policies, and projects	▪The Paris Agreement sets up a technical expert review process for the information provided by countries ▪May be prescribed by domestic laws ▪Under the UNFCCC, review is carried out as part of International Consultation and Analysis (ICA) and International Assessment and Review (IAR) processes ▪For credited mitigation projects, verification prescribed by crediting scheme (e.g. CDM, VCS, Climate Action Reserve (CAR))
	For mitigation projects: ▪Methodological guidance developed under the Clean Development Mechanism (CDM) ▪GHG Protocol Project Standard ▪Gold Standard ▪Verified Carbon Standards (VCS)	**For mitigation policies and projects:** ▪Defined by GHG emissions quantification method and the policy/project type ▪Typically include activity data, emission factors, and socio socio-economic	**For mitigation projects:** To the relevant program (e.g., CDM or emissions trading program) under which the project has been undertaken	
S	▪Nationally Appropriate Mitigation Action (NAMA) Sustainable Development Evaluation Tool ▪CDM Sustainable Development Co-Benefits Tool ▪Methods specific to the sustainable development effect concerned ▪May use guidance from relevant standards such as the GHG Protocol Policy and Action Standard	▪Defined by the type of sustainable development effect under consideration ▪Typically include socio-economic data related to employment, health, air quality, etc.	▪To domestic stakeholders ▪To donors supporting the implementation of policies or projects	▪May be prescribed by domestic laws

I	▪Climate Policy Implementation Tracking Framework ▪Monitoring Implementation and Effects of GHG Mitigation Policies: Steps to Develop Performance Indicators ▪Guidance from donor entities	▪Data related to performance indicators (such as permitting; licensing; procurement; financing; behavioral, technology, and process changes; changes in GHG emissions)	▪To domestic stakeholders ▪To the UNFCCC as part of National Communications, Biennial Reports, and/or Biennial Update Reports, and future reporting requirements yet to be determined for post-2020 contributions ▪To donors supporting the implementation of mitigation actions	▪May be prescribed by domestic laws or as per donor or project under requirements ▪Under the UNFCCC, the review is carried out as part of ICA and IAR processes ▪Technical expert review for post-2020 actions, per the Paris Agreement

Methods for MRV of Support

MEASUREMENT		REPORTING	VERIFICATION
Method	Data Requirements		

Provision of Support	▪Future guidance to be developed for the post-2020 period per the Paris Agreement ▪Common tabular format (CTF) in Biennial Reports under the UNFCCC	▪Intended funding to be provided in the future as per the Paris Agreement ▪Overall amount in US dollars or local currency ▪Source of finance and detailed information on financial	▪Future reporting requirements for post-2020 contributions ▪To the UNFCCC as part of National Communications, Biennial Reports, and/or Biennial Update Reports ▪	▪May be prescribed by domestic laws ▪Under the UNFCCC, review is carried out as part of International Consultation and Analysis (ICA) and International
	▪May use the Organization for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) climate markers or the joint method developed by the multilateral development banks (MDBs)	contributions to climate-specific funds, international financial institutions, and multilateral institutions ▪Detailed information on public bilateral support ▪Indication of new and additional financial resources ▪Information on the provision of support for technology development and capacity building ▪Information on status, funding, source, financial instrument (e.g., grant, concessional finance, equity, loan guarantee, insurance), and sector ▪Sector and/or subsector targeted by finance ▪Category (e.g., asset finance, venture capital support, research, demonstrations, capacity building, training, planning, analysis) ▪Recipient ministry or domestic organization in recipient countries (National Implementing Entity)		Assessment and Review (IAR) processes ▪Technical expert review for post-2020 period, per the Paris Agreement

Receipt of support	▪Climate Public Expenditure and Institutional Review for Domestic Budgeting (CPEIR) ▪Different methods in used by different countries and funding agencies to track and report development and climate finance	▪Climate finance needs and climate finance received as per the Paris Agreement ▪Overall amount in US dollars or local currency ▪Information on status, funding, source, financial instrument (e.g., grant, concessional finance, equity, loan guarantee, insurance), and sector ▪Sector and/or subsector targeted by finance ▪Category (e.g., asset finance, venture capital support, research, demonstrations, capacity building, training, planning, analysis) ▪Recipient ministry or domestic organization in recipient countries (National Implementing Entity)	▪To the UNFCCC as part of National Communications and Biennial Update Reports ▪To domestic stakeholders and donors	▪May be prescribed by domestic laws ▪Under the UNFCCC, review is carried out as part of International Consultation and Analysis (ICA) and International Assessment and Review (IAR) ▪Technical expert review for post-2020 period, per the Paris Agreement
R	▪May use guidance provided by various mitigation funds (e.g., Clean Technology Fund, Global Environment Facility) and donor organizations	▪Data related to indicators such as emissions reduced, volume of private finance leveraged, annual energy savings, etc.	▪To domestic stakeholders as well as existing or potential donors	▪May be prescribed by domestic laws ▪Under the UNFCCC, the review is carried out as part of ICA and IAR processes ▪Technical expert review for post-2020 period, per the Paris Agreement

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